PIONEER®
The Art of Entertainment

Service Manual

DEH-48/X1M/UC

ORDER NO.
CRT1966

HIGH POWER CD PLAYER WITH FM/AM TUNER

DEH-48 X1M/UC
DEH-435 X1M/UC
DEH-43 X1M/UC
DEH-436 X1M/ES
DEH-235 X1M/UC
DEH-236 X1M/ES

COMPACT disc DIGITAL AUDIO

- **See the separate manual CX-597(CRT1829) for the CD mechanism description, disassembly and circuit description.**
- **The CD mechanism employed in this model is one of CX-597 series.**

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● **CD Player Service Precautions**

1. For pickup unit(CXX1230) handling, please refer to"Disassembly"(CX-597 Service Manual CRT1829). During replacement, handling precautions shall be taken to prevent an electrostatic discharge(protection by a short pin).
2. During disassembly, be sure to turn the power off since an internal IC might be destroyed when a connector is plugged or unplugged.
3. Please checking the grating after changing the pickup unit(see page 63).

1. SAFETY INFORMATION

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely; you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5). When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

2. EXPLODED VIEWS AND PARTS LIST

2.1 PACKING

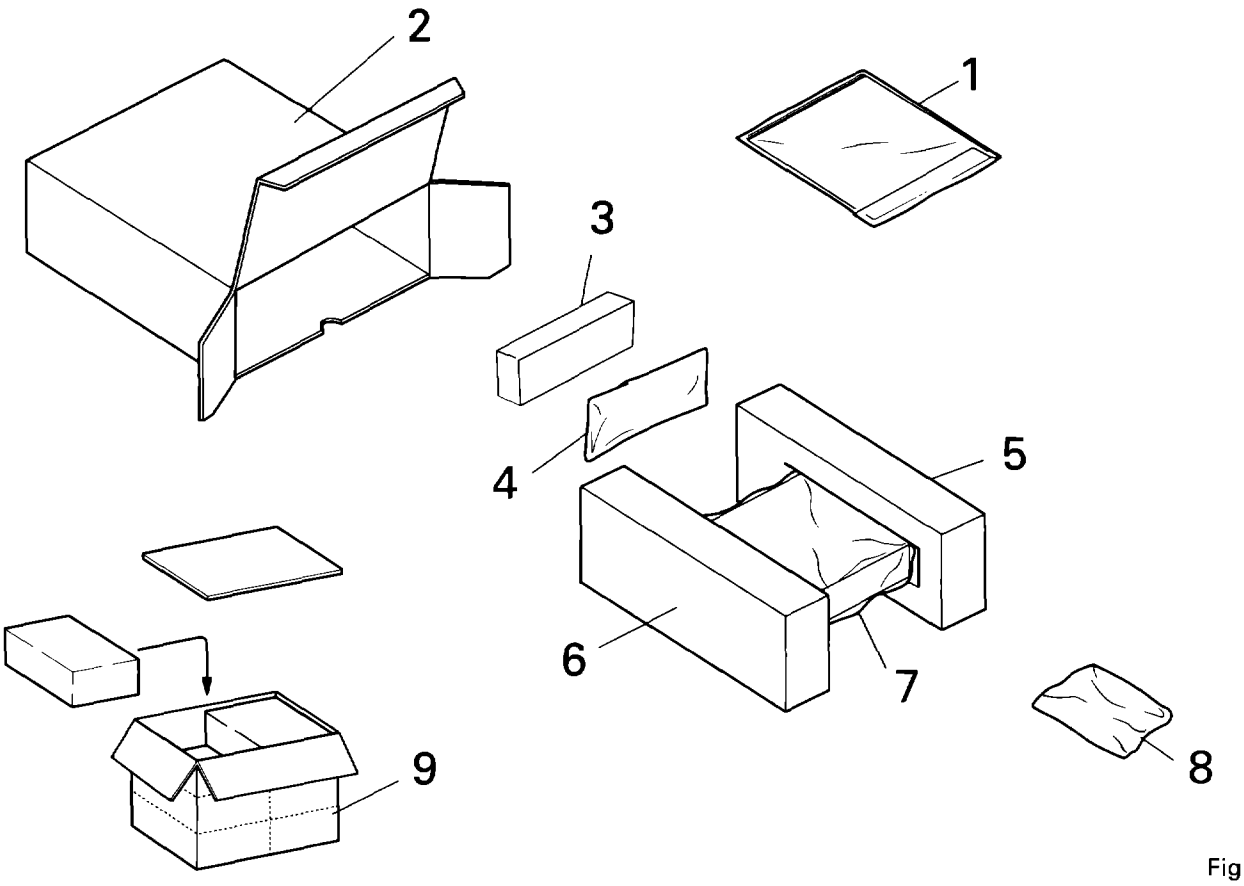


Fig. 1

NOTE:

- Parts marked by "＊"are generally unavailable because they are not in our Master Spare Parts List.
- Screws adjacent to ▼ mark on the product are used for disassembly.

● Parts List

Mark	No.	Symbol & Description	Part No. DEH-48/X1M/UC	DEH-435/X1M/UC	DEH-43/X1M/UC	DEH-436/X1M/ES	DEH-235/X1M/UC	DEH-236/X1M/ES
	1-1	Owner's Manual	CRD2233	CRD2235	CRD2235	CRD2242	CRD2237	CRD2244
	1-2	Installation Manual	CRD2234	CRD2236	CRD2236	CRD2243	CRD2236	CRD2243
	1-3	Polyethylene Bag	CEG1116	CEG1116	CEG1116	CEG1116	CEG1116	CEG1116
*	1-4	Warranty Card	CRY1070	Not used	Not used	Not used	Not used	Not used
*	1-5	Card	Not used	ARY1048	ARY1048	Not used	ARY1048	Not used
	2	Carton	CHG3257	CHG3258	CHG3259	CHG3262	CHG3264	CHG3265
	3	Case Assy	CXB1063	CXB1063	CXB1063	CXB1063	Not used	Not used
	4	Cord	CDE4867	CDE4867	CDE4867	CDE4867	CDE4867	CDE4867
	5	Protector	CHP1769	CHP1769	CHP1769	CHP1769	CHP1769	CHP1769
	6	Protector	CHP1768	CHP1768	CHP1768	CHP1768	CHP1768	CHP1768
	7	Polyethylene Bag	CEG1173	CEG1173	CEG1173	CEG-162	CEG1173	CEG-162
	8	Accessory Assy	CEA1918	CEA1918	CEA1918	CEA2002	CEA1918	CEA2002
	9	Contain Box	CHL3257	CHL3258	CHL3259	CHL3262	CHL3264	CHL3265

● Owner's Manual

Model	Part No.	Language
DEH-48/X1M/UC	CRD2233	English, French
DEH-43/X1M/UC, DEH-435/X1M/UC	CRD2235	English, French, Spanish
DEH-436/X1M/ES	CRD2242	English, French, Spanish, Arabic
DEH-235/X1M/UC	CRD2237	English, French, Spanish
DEH-236/X1M/ES	CRD2244	English, French, Spanish, Arabic

● Installation Manual

Model	Part No.	Language
DEH-48/X1M/UC	CRD2234	English, French
DEH-43/X1M/UC, DEH-435/X1M/UC	CRD2236	English, French, Spanish
DEH-436/X1M/ES	CRD2243	English, French, Spanish, Arabic
DEH-235/X1M/UC	CRD2236	English, French, Spanish
DEH-236/X1M/ES	CRD2243	English, French, Spanish, Arabic

● Accessory Assy

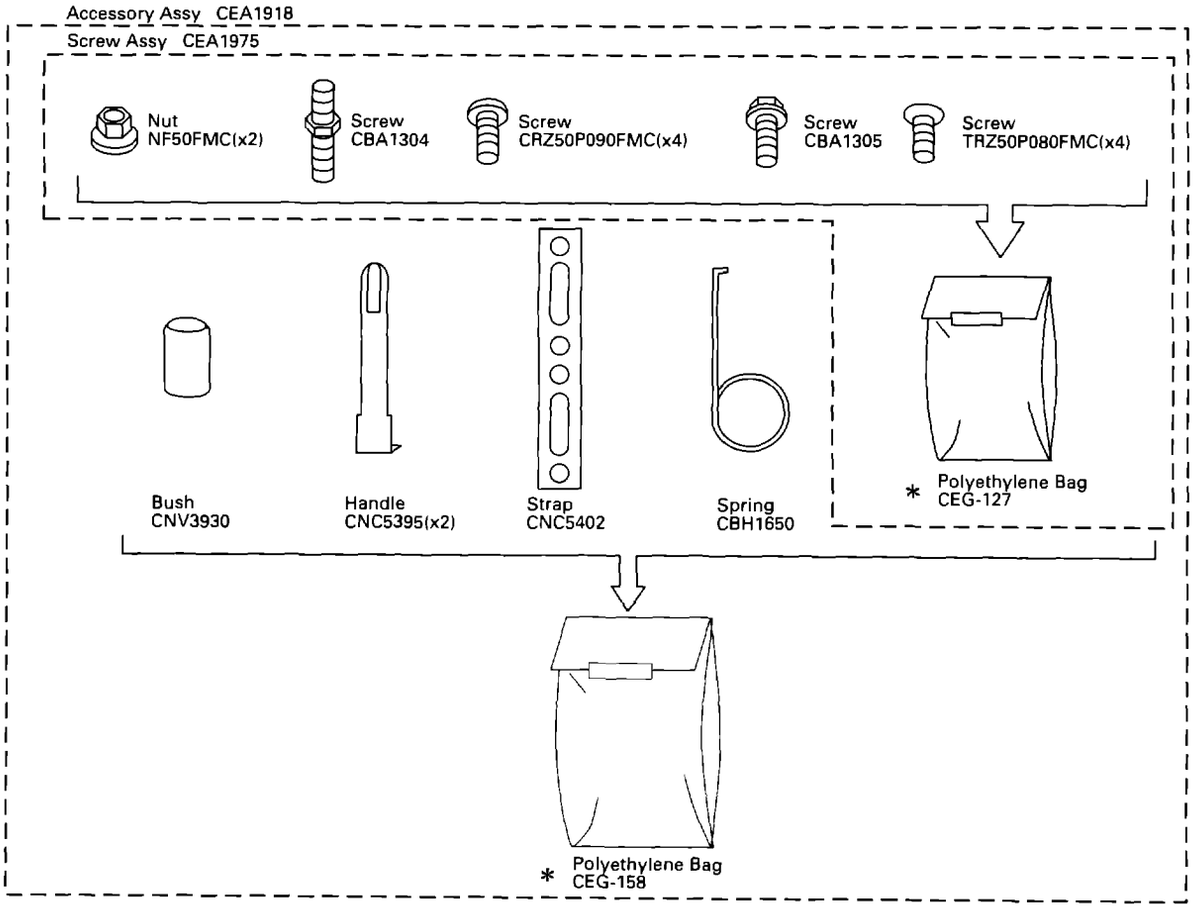


Fig. 2

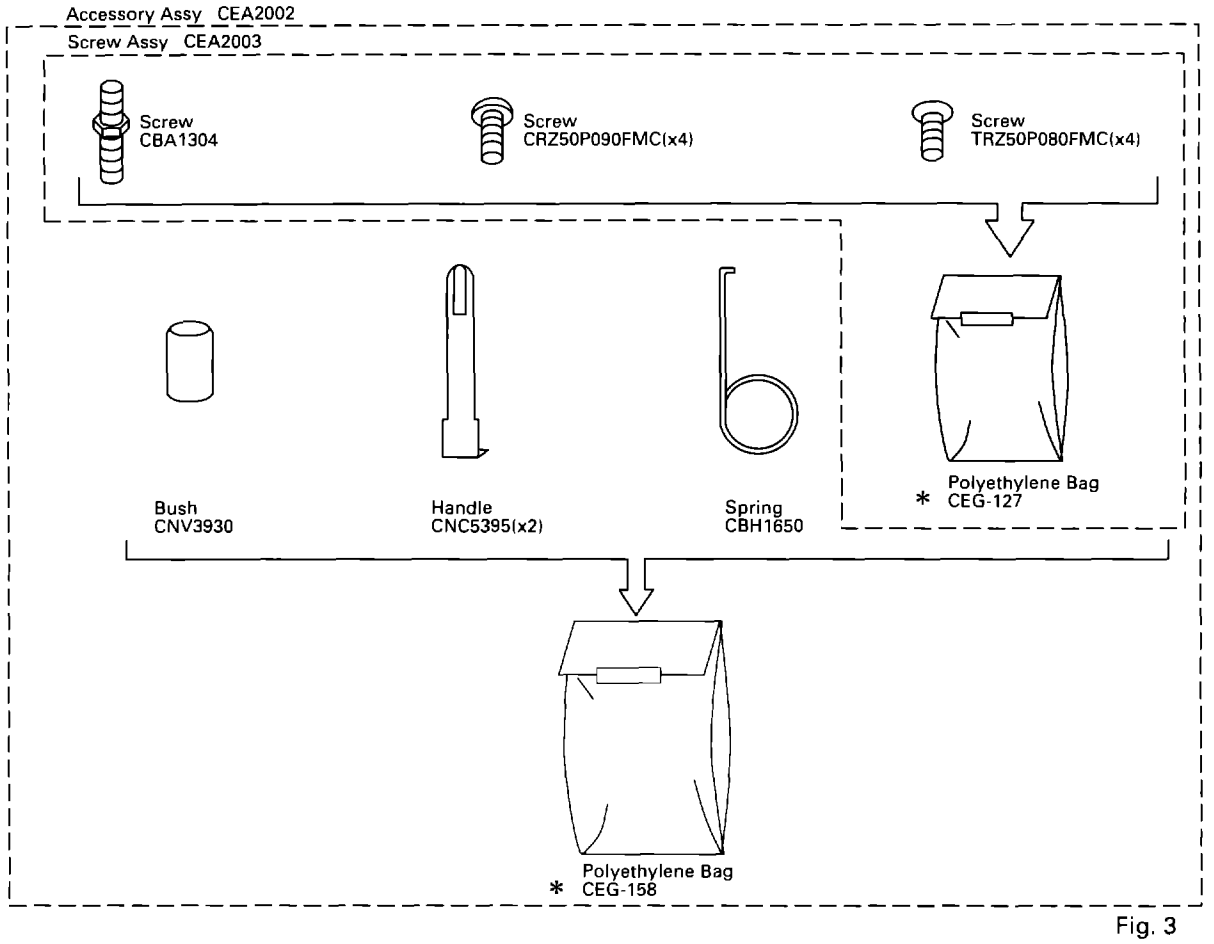

Accessory Assy CEA2002
Screw Assy CEA2003
Screw
CBA1304
Screw
CRZ50P090FMC(x4)
Screw
TRZ50P080FMC(x4)
Bush
CNV3930
Handle
CNC5395(x2)
Spring
CBH1650
Polyethylene Bag
* CEG-127
Polyethylene Bag
* CEG-158

Fig. 3

2.2 CD MECHANISM MODULE

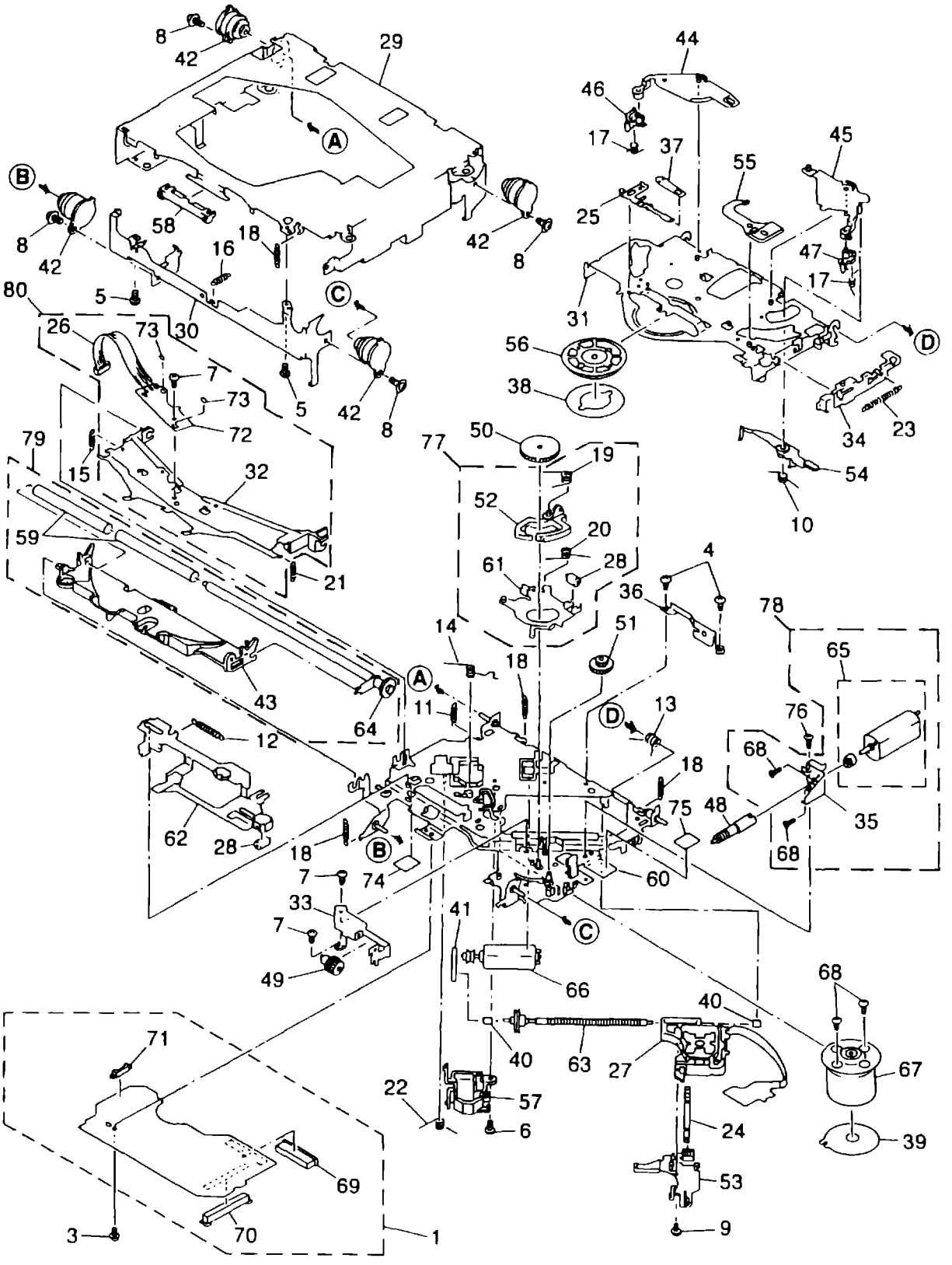


Fig. 4

● Parts List

Mark	No.	Description	Part No.
	1	Control Unit	CWX1889
	2	•••••	
	3	Screw	IMS26P035FMC
	4	Screw	BMZ20P040FMC
	5	Screw	BSZ20P040FMC
	6	Screw(M2×3)	CBA1077
	7	Screw(M2×2)	CBA1250
	8	Screw(M2×5)	CBA1296
	9	Screw(M2×3.85)	CBA1362
	10	Spring	CBH1916
	11	Spring	CBH1724
	12	Spring	CBH1939
	13	Spring	CBH1729
	14	Spring	CBH1730
	15	Spring	CBH1731
	16	Spring	CBH1732
	17	Spring	CBH1736
	18	Spring	CBH1745
	19	Spring	CBH1832
	20	Spring	CBH1833
	21	Spring	CBH1848
	22	Spring	CBH1849
	23	Spring	CBH1863
	24	Spring	CBL1214
	25	Spring	CBL1269
	26	Connector(CN1)	CDE4576
	27	Pickup Unit(Service)	CXX1230
	28	Roller	CLA2627
	29	Frame	CNC5796
	30	Frame	CNC5797
	31	Arm	CNC5799
	32	Arm	CNC5801
	33	Bracket	CNC5871
	34	Lever	CNC6054
	35	Bracket	CNC6056
*	36	Bracket	CNC6376
	37	Spacer	CNM3315
	38	Sheet	CNM4849
	39	PCB	CNP4230
	40	Bearing	CNR1415
	41	Belt	CNT1071
	42	Damper	CNV3974
	43	Arm	CNV4120
	44	Arm	CNV4122
	45	Arm	CNV4123
	46	Arm	CNV4124
	47	Arm	CNV4125
	48	Gear	CNV4128
	49	Gear	CNV4129
	50	Gear	CNV4130
	51	Gear	CNV4131
	52	Arm	CNV4136
	53	Holder	CNV4663
	54	Arm	CNV4138
	55	Arm	CNV4139
	56	Clamper	CNV4712
	57	Holder	CNV4664
	58	Guide	CNV4484
	59	Roller	CNV4509
	60	Chassis Unit	CXA8561
	61	Arm Unit	CXA8565
	62	Lever Unit	CXA9300
	63	Screw Unit	CXA9388
	64	Gear Unit	CXA9389
	65	Load Motor Unit(M3)	CXA9391
	66	CRG Motor Unit(M2)	CXA9392
	67	Motor Unit(M1)	CXA9407
	68	Screw	JFZ20P025FMC
	69	Connector(CN101)	CKS1953
	70	Connector(CN701)	CKS2774
	71	Connector(CN801)	CKS2196
*	72	Gathering PCB	CNX2445
	73	Photo-transistor(Q1, 2)	CPT-230S-X
	74	Sheet	CNM4873
	75	Cushion	CNM3917
	76	Screw	BMZ20P025FMC
	77	•••••	
	78	•••••	
	79	•••••	
	80	•••••	

2.3 EXTERIOR(DEH-235/X1M/UC, DEH-236/X1M/ES)

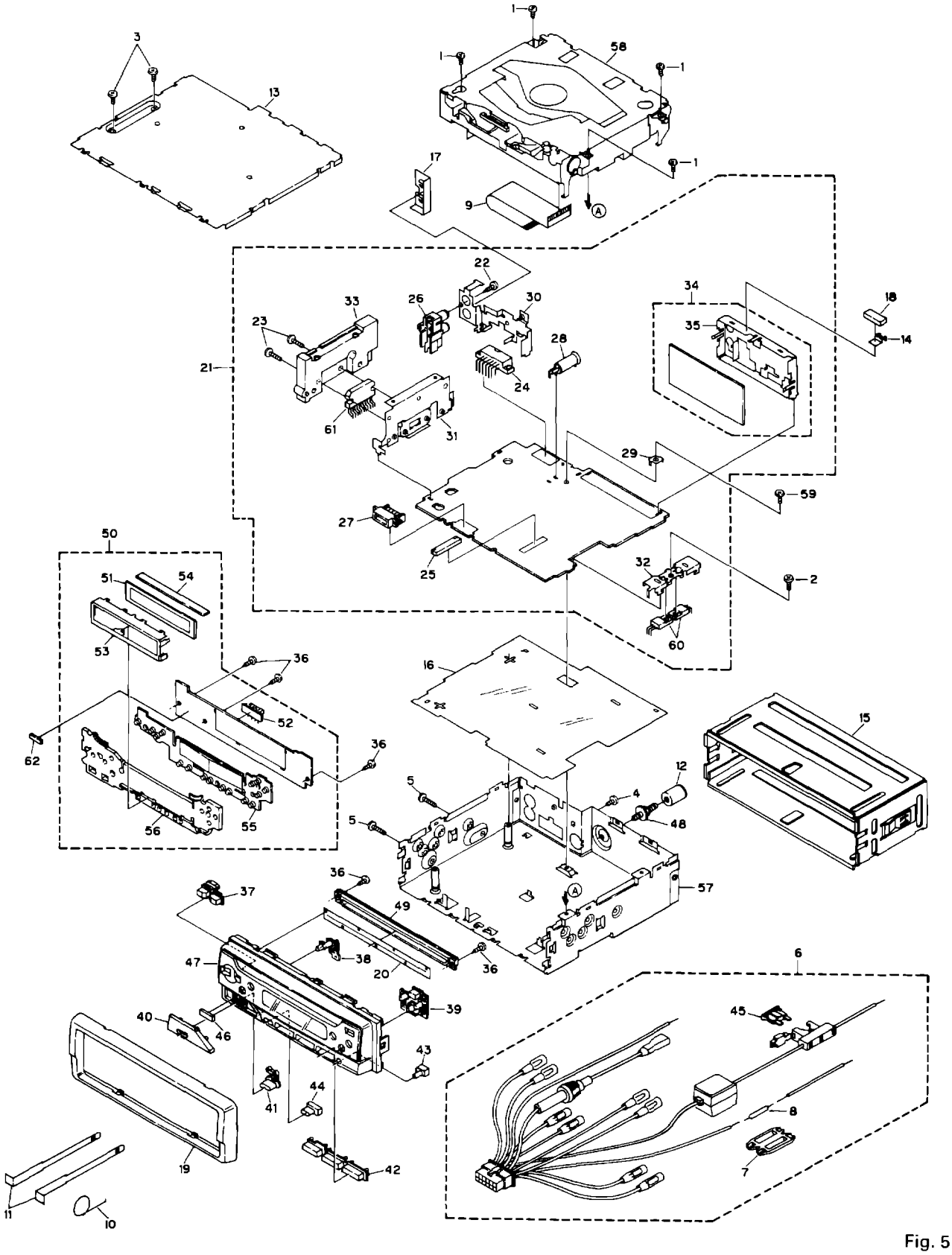


Fig. 5

● Parts List

Mark No.	Description	Part No.
1	Screw	BSZ26P050FMC
2	Screw	ASZ26P080FMC
3	Screw	BSZ30P050FMC
4	Screw	BSZ30P060FMC
5	Screw	BSZ30P160FMC
6	Cord	CDE4867
7	Cap	CNS1472
8	Resistor	RS1/2PMF102J
9	Cable	CDE4869
10	Spring	CBH1650
11	Handle	CNC5395
12	Bush	CNV3930
13	Case	CNB1989
14	Holder	CNC6469
15	Holder	CNC6798
16	Insulator	CNM5067
17	Insulator	CNM4811
18	Cushion	CNM5210
19	Panel	CNS4200
20	Cover	CNM4704
21	Tuner Amp Unit (DEH-235/X1M/UC)	CWM4968
	Tuner Amp Unit (DEH-236/X1M/ES)	CWM4969
22	Screw	BPZ26P120FMC
23	Screw	BSZ26P120FMC
24	Plug(CN951)	CKM1225
25	Connector(CN681)	CKS2228
26	Connector(CN421)	CKS3357
27	Connector(CN651)	CKS3581
28	Antenna Jack(CN501)	CKX1056
29	Holder	CNC5399
30	Bracket	CNC6130
31	Holder	CNC6131
32	Holder	CNC6132

Mark No.	Description	Part No.
33	Heat Sink	CNR1407
34	FM/AM Tuner Unit (DEH-235/X1M/UC)	CWE1417
	FM/AM Tuner Unit (DEH-236/X1M/ES)	CWE1485
35	Holder	CNC6555
36	Screw	BPZ20P100FZK
37	Button(S.SEEK)	CAC4900
38	Button(LOC.CLOCK)	CAC4901
39	Button(EJECT)	CAC5248
40	Button(- +)	CAC4903
41	Button(SOURCE)	CAC4904
42	Button(1-6)	CAC4905
43	Button(BSM)	CAC4906
44	Button(BAND)	CAC4907
45	Fuse(10A)	CEK1136
46	Cushion	CNM5156
47	Grille Unit (DEH-235/X1M/UC)	CXB1469
	Grille Unit (DEH-236/X1M/ES)	CXB1470
48	Screw	CBA1304
49	Holder	CNV4778
50	Keyboard Unit	CWM5203
51	LCD(LCD901)	CAW1330
52	Connector(CN901)	CKS3580
53	Holder	CNC6873
54	Connector	CNV4449
55	Rubber	CNV4766
56	Lighting Conductor	CNV4777
57	Chassis Unit	CXA9729
58	CD Mechanism Module(S7)	CXK4201
59	Screw	BSZ30P055FUC
60	Transistor(Q981,991)	2SD2396
61	IC(IC551)	TDA7384A
62	Cushion	CNM5271

2.4 EXTERIOR (EXCEPT FOR DEH-235/X1M/UC, DEH-236/X1M/ES)

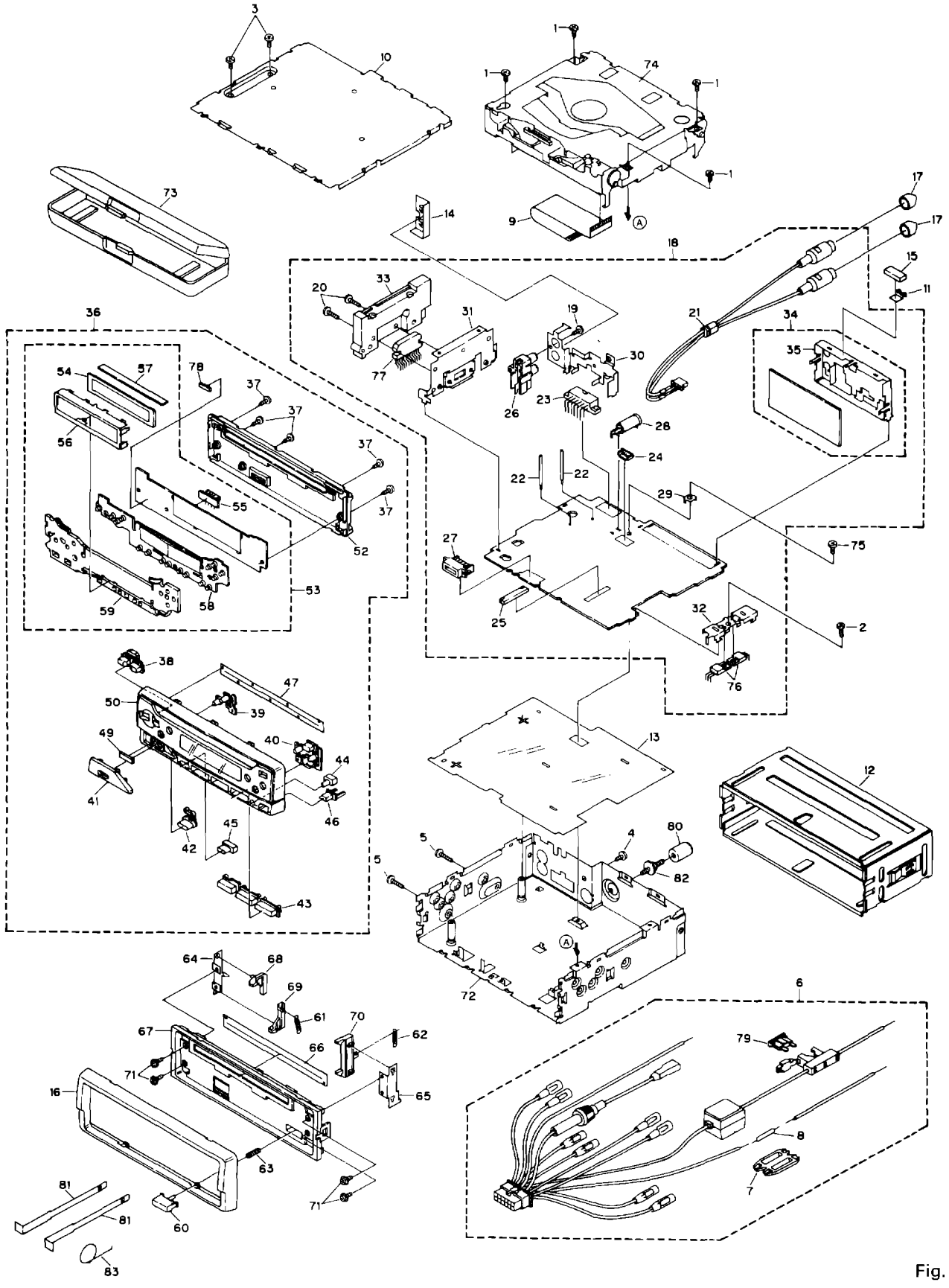


Fig. 6

(1)PARTS LIST

Mark No.	Description	Part No.
1	Screw	BSZ26P050FMC
2	Screw	ASZ26P080FMC
3	Screw	BSZ30P050FMC
4	Screw	BSZ30P060FMC
5	Screw	BSZ30P160FMC
6	Cord	CDE4867
7	Cap	CNS1472
8	Resistor	RS1/2PMF102J
9	Cable	CDE4869
10	Case	CNB1989
11	Holder	CNC6469
12	Holder	CNC6798
13	Insulator	CNM5067
14	Insulator	CNM4811
15	Cushion	CNM5210
16	Panel	CNS4200
17	Cap	See Contrast table(2)
18	Tuner Amp Unit	See Contrast table(2)
19	Screw	BPZ26P120FMC
20	Screw	BSZ26P120FMC
21	Cord	See Contrast table(2)
22	Clamper	See Contrast table(2)
23	Plug(CN951)	CKM1225
24	Plug(CN422)	CKS1238
25	Connector(CN681)	CKS2228
26	Connector(CN421)	CKS3357
27	Connector(CN651)	CKS3581
28	Antenna Jack(CN501)	CKX1056
29	Holder	CNC5399
30	Bracket	CNC6130
31	Holder	CNC6131
32	Holder	CNC6132
33	Heat Sink	CNR1407
34	FM/AM Tuner Unit	See Contrast table(2)
35	Holder	CNC6555
36	Detach Grille Assy	See Contrast table(2)
37	Screw	BPZ20P100FZK
38	Button(S.SEEK)	CAC4900
39	Button(LOC.CLOCK)	CAC4901
40	Button(EJECT)	CAC5248
41	Button(- +)	CAC4903
42	Button(SOURCE)	CAC4904
43	Button(1-6)	CAC4905
44	Button(BSM)	CAC4906
45	Button(BAND)	CAC4907

Mark No.	Description	Part No.
46	Button(DETACH)	CAC4908
47	Cover	CNM4704
48	•••••	
49	Cushion	CNM5156
50	Grille Unit	See Contrast table(2)
51	•••••	
52	Cover	CNS4203
53	Keyboard Unit	CWM4973
54	LCD(LCD901)	CAW1330
55	Connector(CN901)	CKS3580
56	Holder	CNC6873
57	Connector	CNV4449
58	Rubber	CNV4766
59	Lighting Conductor	CNV4777
60	Button	CAC4836
61	Spring	CBH1834
62	Spring	CBH1835
63	Spring	CBH1933
64	Bracket	CNC6135
65	Bracket	CNC6791
66	Cover	CNM4875
67	Panel	CNS4209
68	Arm	CNV4692
69	Arm	CNV4693
70	Arm	CNV4728
71	Screw	IMS20P030FZK
72	Chassis Unit	See Contrast table(2)
73	Case Assy	CXB1063
74	CD Mechanism Module(S7)	CXK4201
75	Screw	BSZ30P055FUC
76	Transistor(Q981,991)	2SD2396
77	IC(IC551)	TDA7384A
78	Cushion	CNM5271
79	Fuse(10A)	CEK1136
80	Bush	CNV3930
81	Handle	CNC5395
82	Screw	CBA1304
83	Spring	CBH1650

(2) CONTRAST TABLE

DEH-48/X1M/UC, DEH-435/X1M/UC, DEH-43/X1M/UC and DEH-436/X1M/ES have the same construction except for the following:

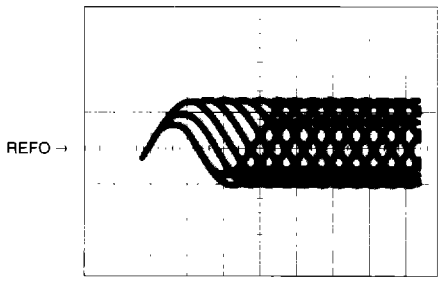
Mark No.	Symbol & Description	Part No.			
		DEH-48/X1M/UC	DEH-435/X1M/UC	DEH-43/X1M/UC	DEH-436/X1M/ES
17	Cap	CNV2680	Not used	Not used	Not used
18	Tuner Amp Unit	CWM4964	CWM4965	CWM4966	CWM4967
21	Cord	CDE4770	Not used	Not used	Not used
22	Clmper	CEF1005	Not used	Not used	Not used
34	FM/AM Tuner Unit	CWE1417	CWE1417	CWE1417	CWE1485
36	Detach Grille Assy	CXA9574	CXA9575	CXA9576	CXA9577
50	Grille Unit	CXB1465	CXB1466	CXB1467	CXB1468
72	Chassis Unit	CXA9687	CXA9729	CXA9729	CXA9729

3. SCHEMATIC DIAGRAM

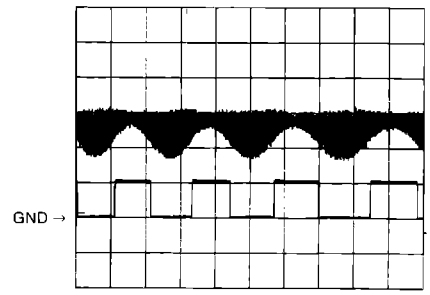
Note:1. The encircled numbers denote measuring pointes in the circuit diagram.
2. Reference voltage
REFO:2.5V

● Waveforms

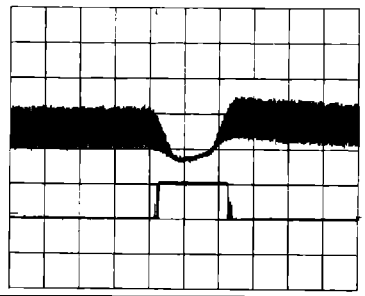
① RFO 0.5V/div. 0.5μs/div.
Normal mode: play



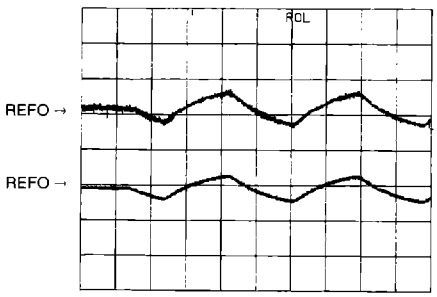
① CH1: RFO 1V/div. 0.5ms/div.
② CH2: MIRR 5V/div.
Test mode: Tracking open



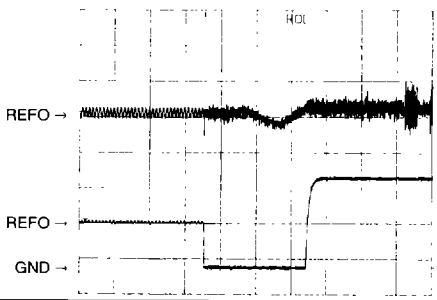
① CH1: RFO 1V/div. 0.5ms/div.
② CH2: MIRR 5V/div.
Nomal mode: The defect part passes 800μm



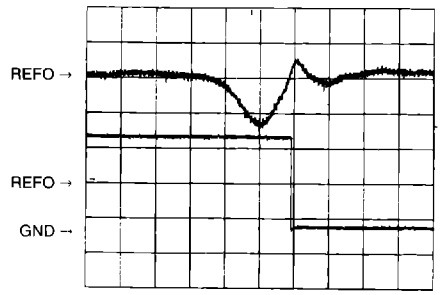
③ CH1: FIN 0.5V/div. 0.2s/div.
④ CH2: FO+ 2V/div.
Test mode: No disc, Focus close



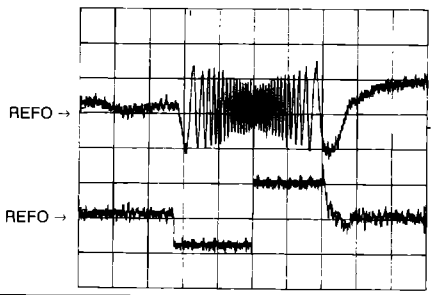
③ CH1: FIN 0.5V/div. 0.2s/div.
⑤ CH2: FOK 2V/div.
Normal mode: Focus close



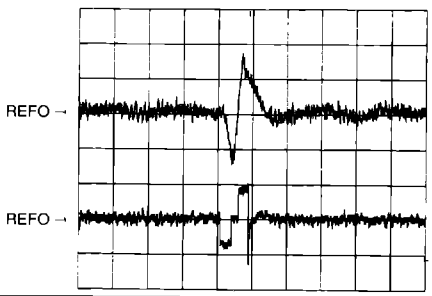
⑥ CH1: FEY 0.5V/div. 1ms/div.
⑦ CH2: XSI 2V/div.
Normal mode: Focus close



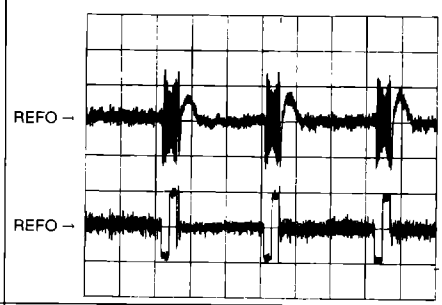
⑧ CH1: TEY 0.5V/div. 0.5ms/div.
⑨ CH2: TIN 0.5V/div.
Test mode: 32 tracks jump (FWD)



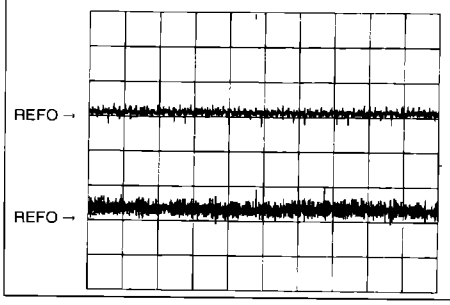
⑧ CH1: TEY 0.5V/div. 0.5ms/div.
⑨ CH2: TIN 0.5V/div.
Test mode: Single jump (FWD)



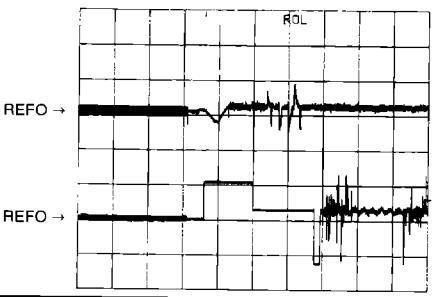
⑧ CH1: TEY 0.5V/div. 5ms/div.
⑨ CH2: TIN 0.5V/div.
Test mode: 100 tracks jump (FWD)



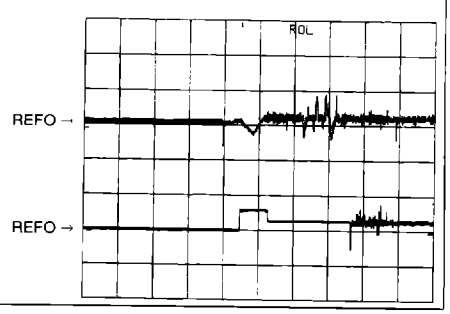
⑥ CH1: FEY 0.1V/div. 20ms/div.
③ CH2: FIN 0.2V/div.
Normal mode: Play



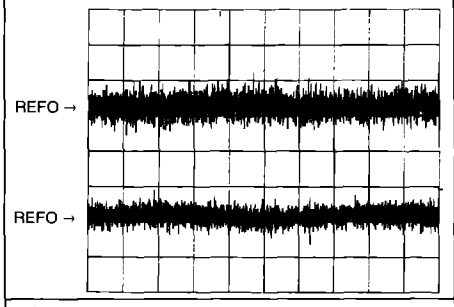
③ CH1: FIN 0.5V/div. 0.5s/div.
⑩ CH2: SIN 1V/div.
Normal mode: Focus close (12cm)



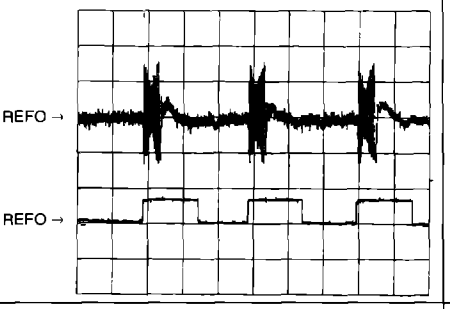
③ CH1: FIN 0.5V/div. 0.5s/div.
⑩ CH2: SIN 1V/div.
Normal mode: Focus close (8cm)



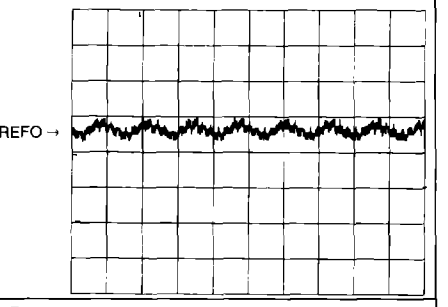
⑧ CH1: TEY 0.2V/div. 20ms/div.
⑨ CH2: TIN 0.2V/div.
Normal mode: play



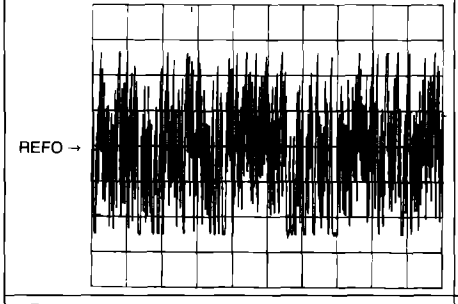
⑧ CH1: TEY 0.5V/div. 5ms/div.
⑪ CH2: SD 0.5V/div.



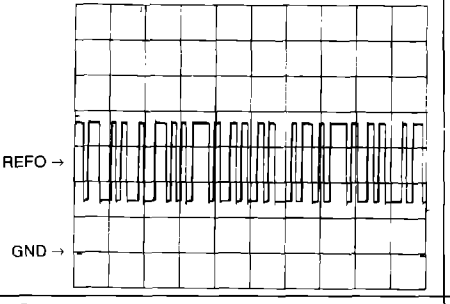
⑩ SIN 0.5V/div. 0.1s/div.
Normal mode: Play (12cm)



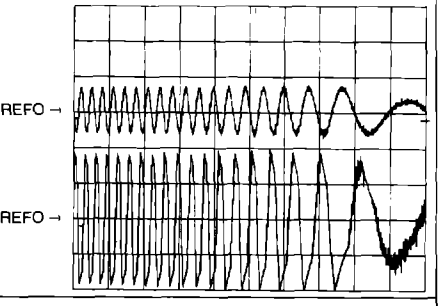
⑩ SIN 0.5V/div. 10ms/div.
Long Search (12cm)



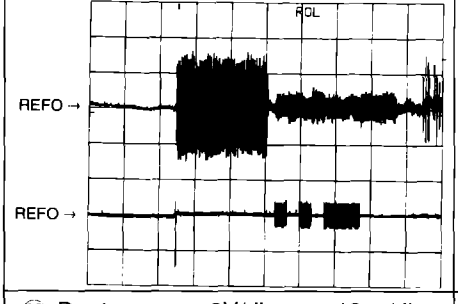
⑫ EFM 1V/div. 5µs/div.
Play



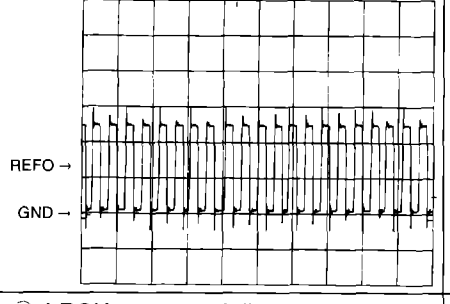
⑧ CH1: TEY 1V/div. 2ms/div.
⑬ CH2: TEC 1V/div.
Test mode: Focus close
Tracking open



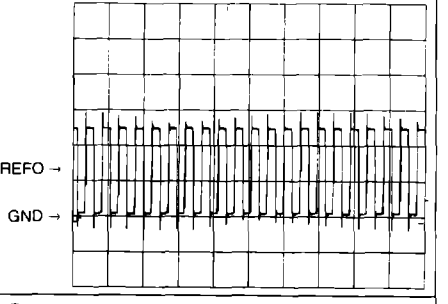
⑧ CH1: TEY 0.5V/div. 0.2s/div.
⑥ CH2: FEY 0.5V/div.
Normal mode: AGC after focus close



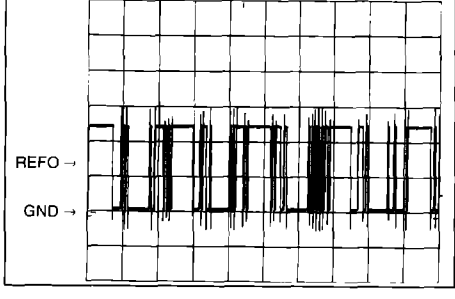
⑭ PLCK 2V/div. 0.5µs/div.
Play



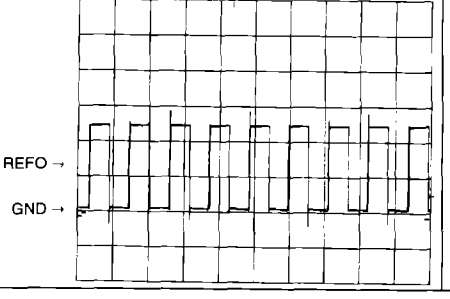
⑮ SCKO 2V/div. 1µs/div.
Play



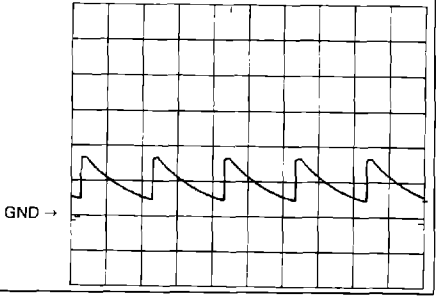
⑯ Dout 2V/div. 10µs/div.
Play



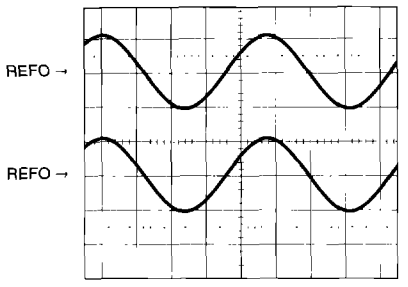
⑰ LRCK 2V/div. 20µs/div.



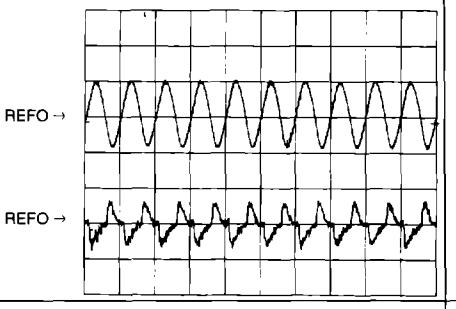
⑱ VD 5V/div. 50ms/div.
Normal mode: No disc



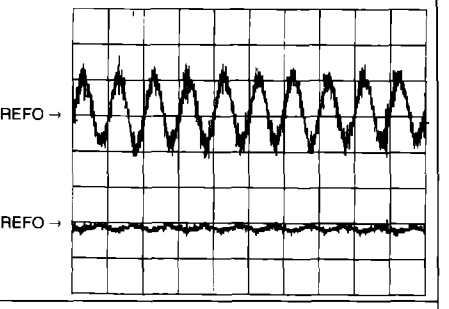
⑲ CH1: R OUT 1V/div.
⑳ CH2: L OUT 1V/div. 0.2ms/div.
Normal mode: Play (1kHz 0dB)



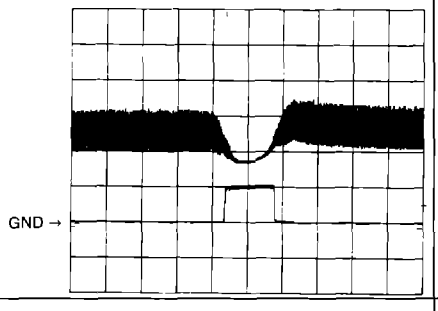
⑥ CH1: FEY 0.2V/div.
③ CH2: FIN 0.5V/div. 1ms/div.
Normal mode: During AGC



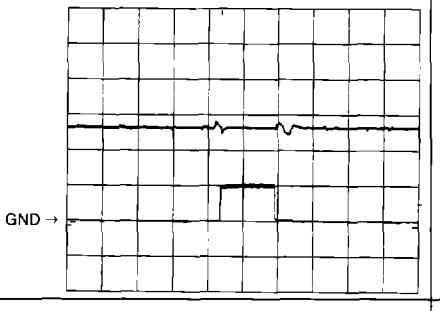
⑧ CH1: TEY 0.2V/div.
⑨ CH2: TIN 0.5V/div. 1ms/div.
Normal mode: During AGC



① CH1: RFO 1V/div.
㉑ CH2: HOLD 5V/div. 0.5ms/div.
Normal mode: The defect part passes 800µm

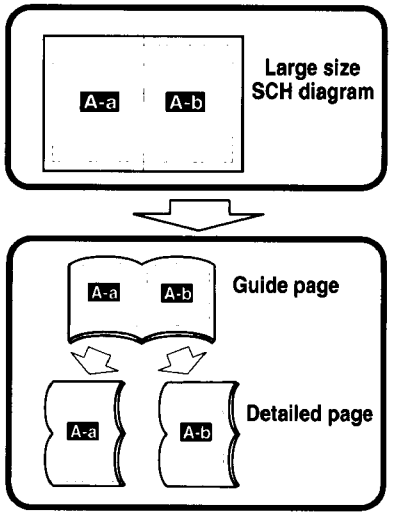


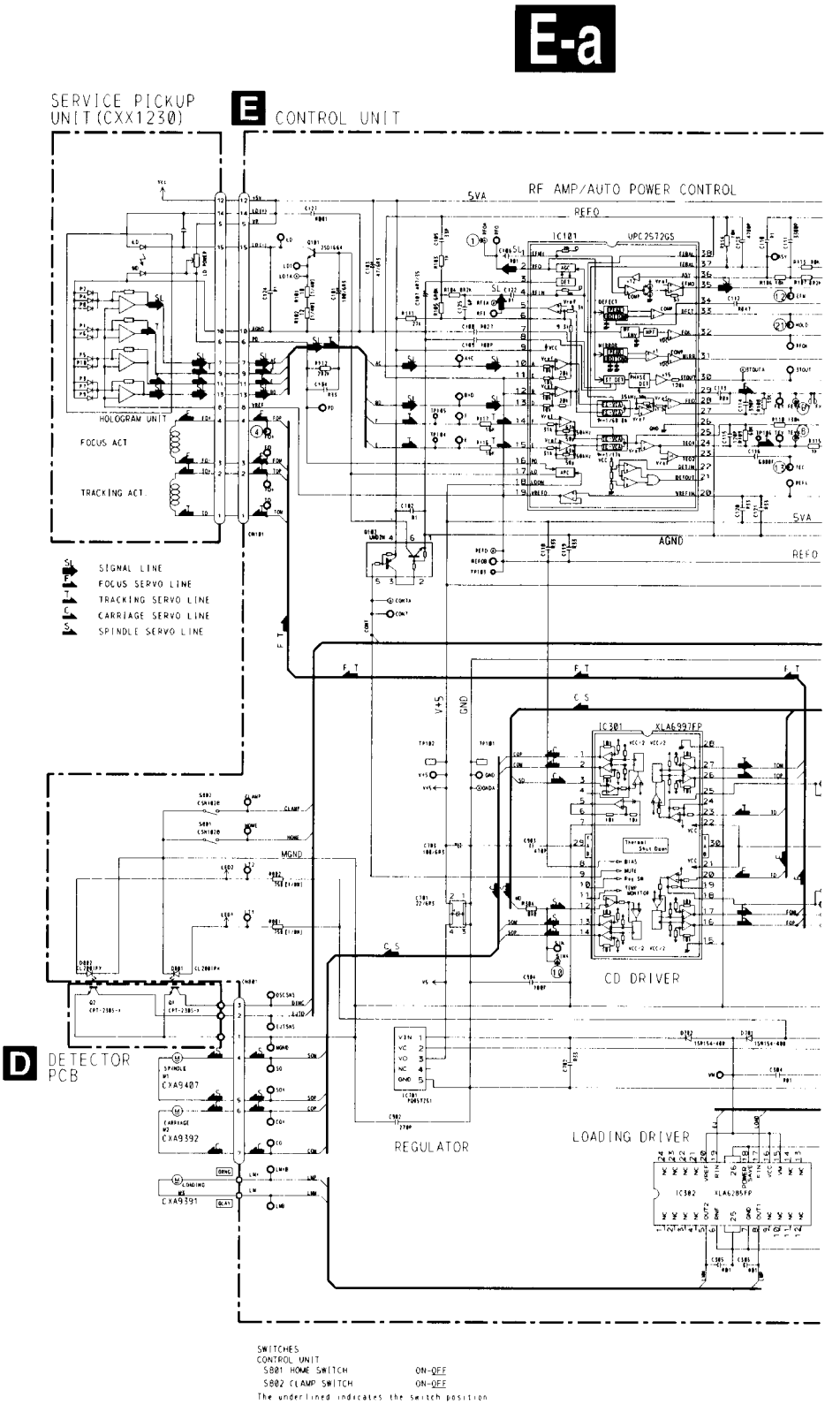
③ CH1: FIN 1V/div.
㉑ CH2: HOLD 5V/div. 0.5ms/div.
Normal mode: The defect part passes 800µm



3.1 CD MECHANISM MODULE(GUIDE PAGE)

Note: When ordering service parts, be sure to refer to "EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".





E-b

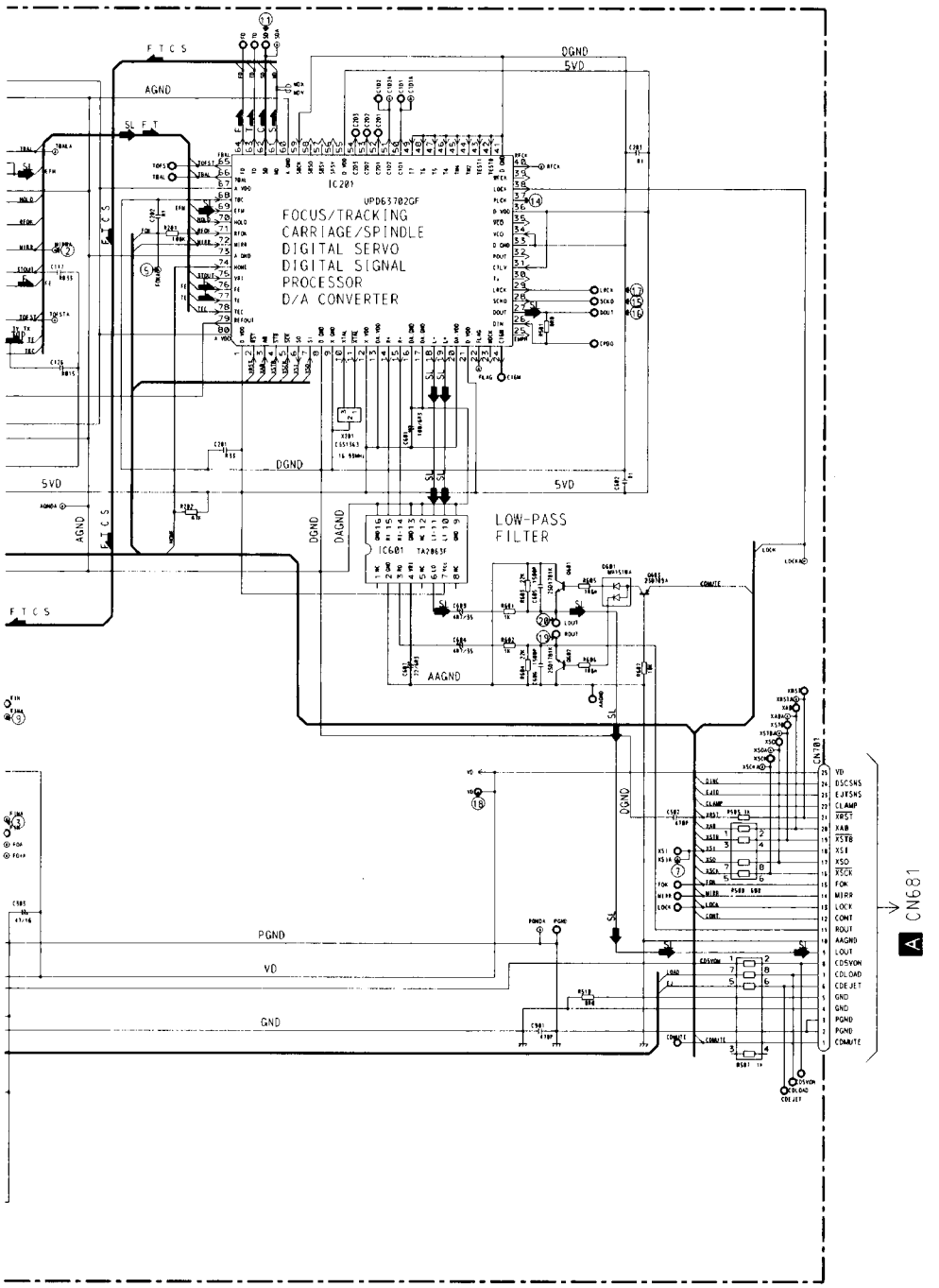
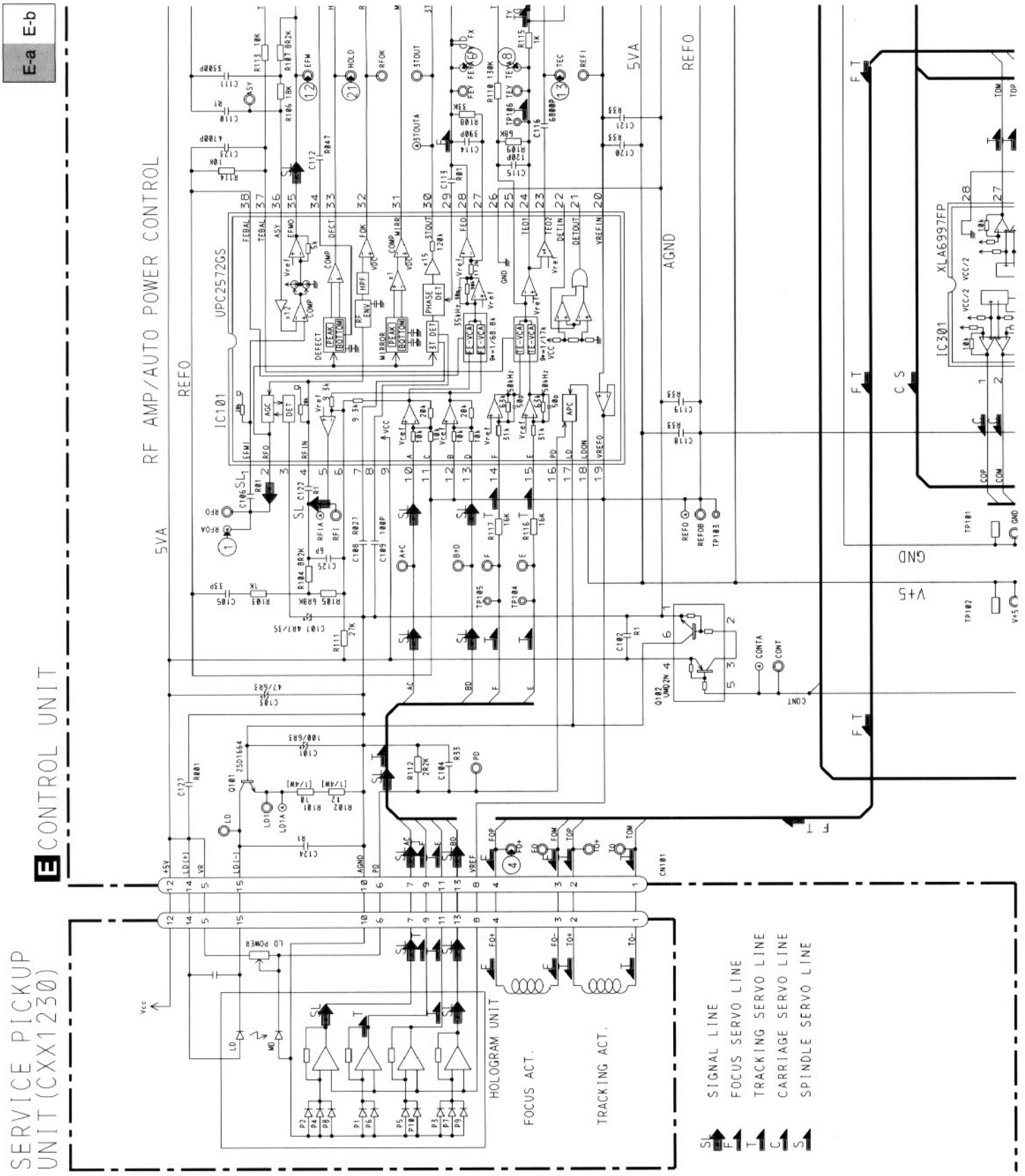

FTCS
AGND
SLFT
DGND
5VD
IC201
UPD63702GF
FOCUS/TRACKING
CARRIAGE/SPINDLE
DIGITAL SERVO
DIGITAL SIGNAL
PROCESSOR
D/A CONVERTER
LOW-PASS
FILTER
IC601
TA2063F
DAGND
AAGND
PGND
VD
GND
CN701
CN681

Fig. 7


E-a E-b
E CONTROL UNIT
RF AMP/AUTO POWER CONTROL
UPC2572GS
IC101
IC301
XLA6997FP
5VA
REFO
AGND
GND
V+5
SERVICE PICKUP
UNIT (CXX1230)
HOLOGRAM UNIT
FOCUS ACT.
TRACKING ACT.
SIGNAL LINE
FOCUS SERVO LINE
TRACKING SERVO LINE
CARRIAGE SERVO LINE
SPINDLE SERVO LINE

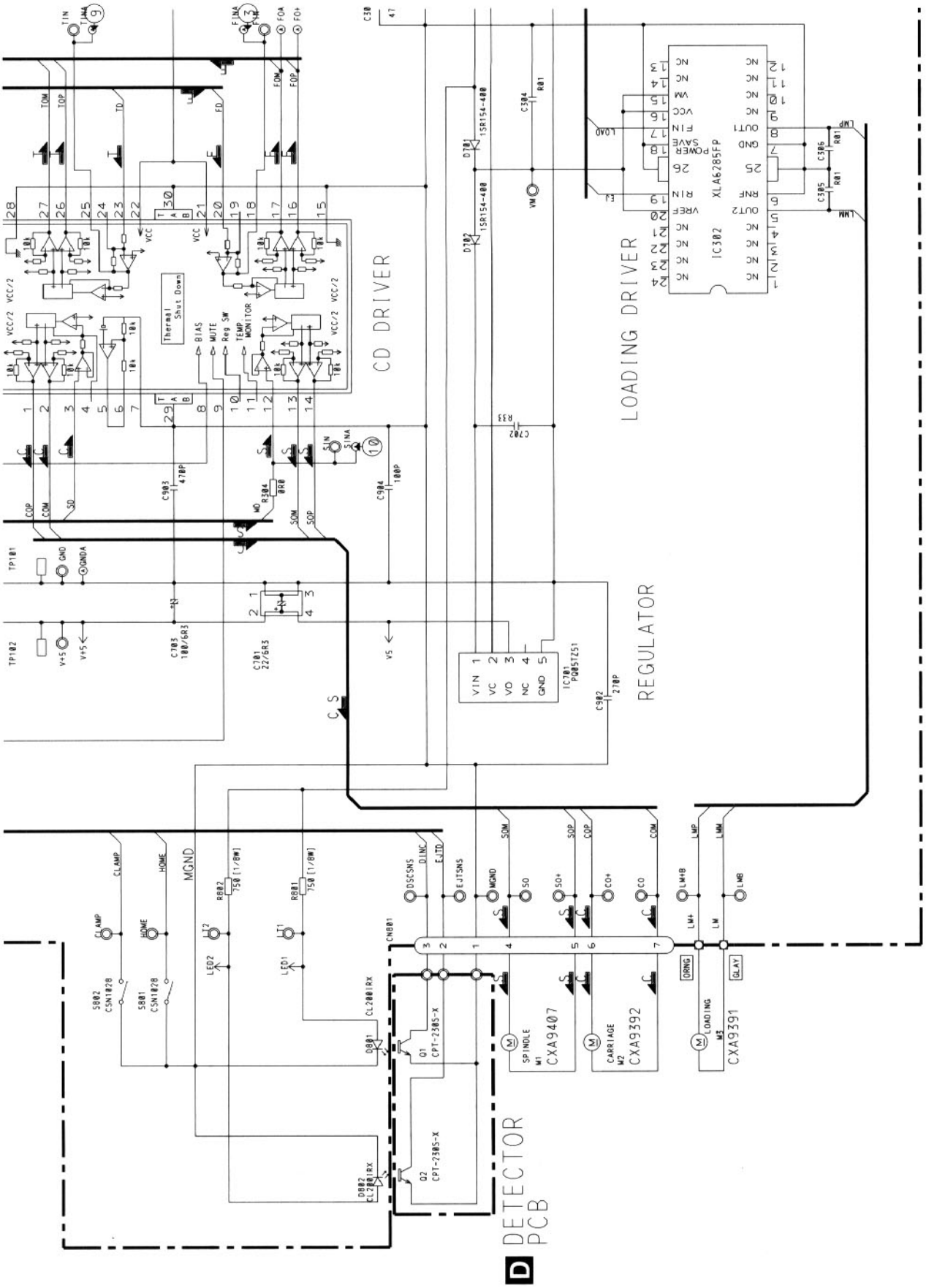
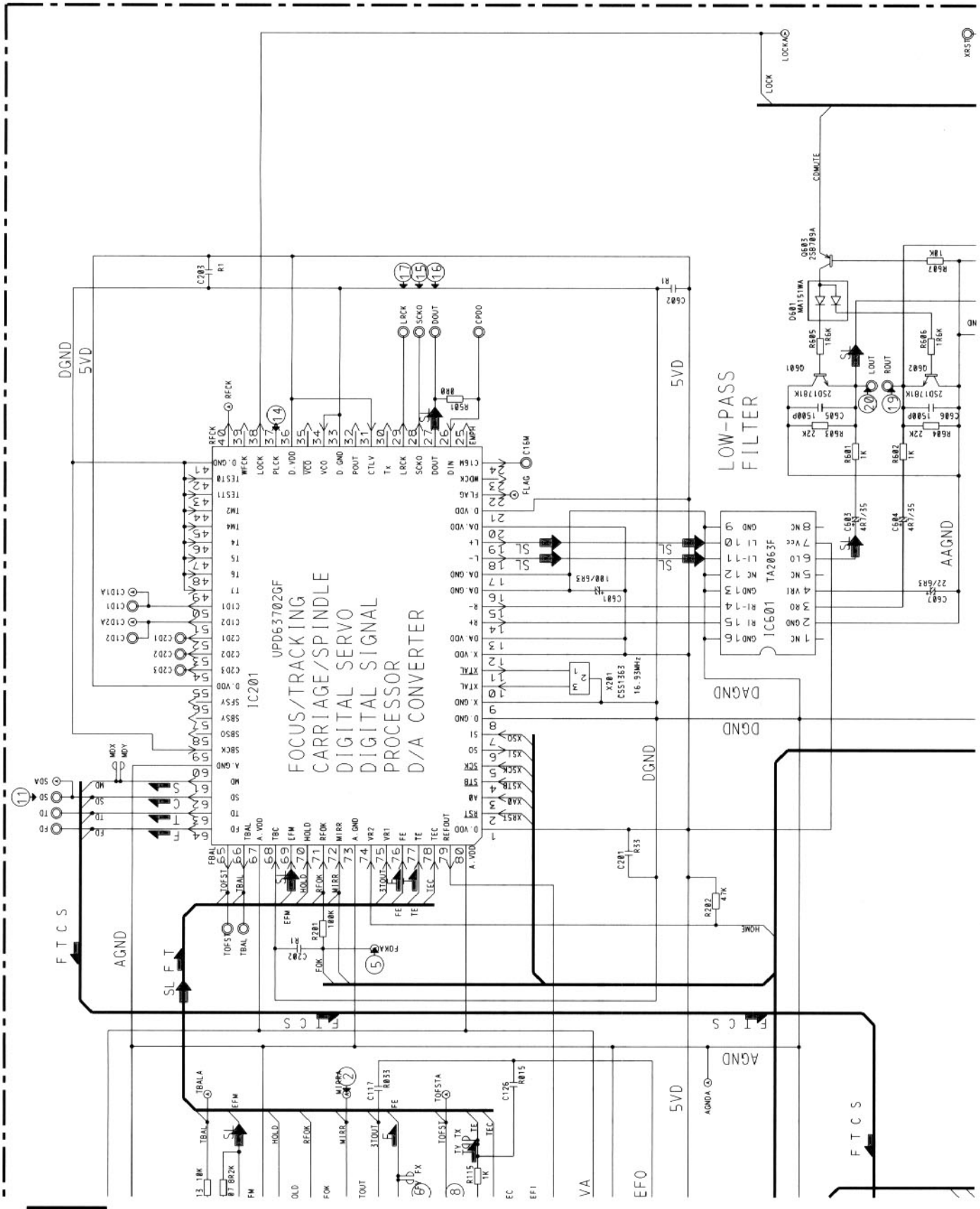

CD DRIVER
LOADING DRIVER
REGULATOR
DETECTOR PCB
SPINDLE M1 CXA9407
CARRIAGE M2 CXA9392
LOADING M3 CXA9391
IC302 XLA6285FP
IC701 PQ05TZ51
CN801
Q1 CPT-2385-X
Q2 CPT-2385-X
SWITCHES:
CONTROL UNIT
S801:HOME SWITCH ·····ON-OFF
S802:CLAMP SWITCH ·····ON-OFF
The underlined indicates the switch position.

Fig. 8


IC201
UPD63702GF
FOCUS/TRACKING
CARRIAGE/SPINDLE
DIGITAL SERVO
DIGITAL SIGNAL
PROCESSOR
D/A CONVERTER
IC6601
TA2063F
LOW-PASS
FILTER
X201
CSS1363
16.93MHz
DGND
5VD
AGND
AAGND
DAGND
FTCS
SLFT
LOCK
COMMUTE
LOUT
ROUT
LRCK
SCKO
DOUT
CPDO
RFCK
EFM
HOLD
RFOK
MIRR
FOK
TOFS
TBAL
FE
TE
TEC
VA
EFO
EC
EFI
HOME

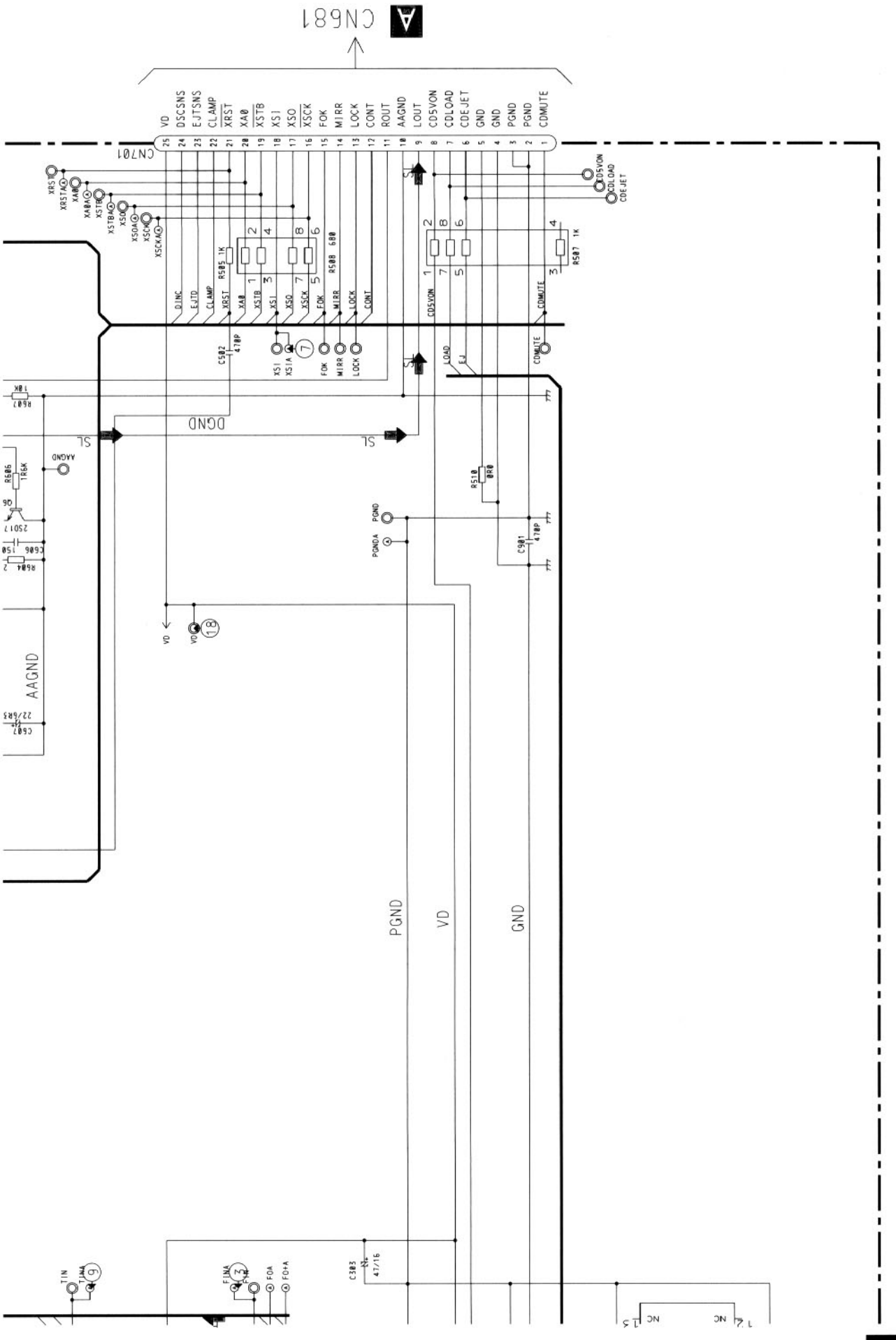
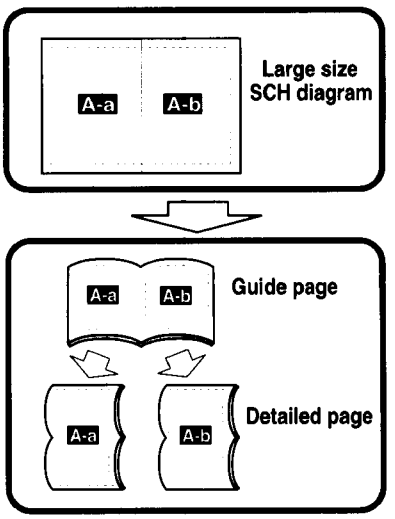
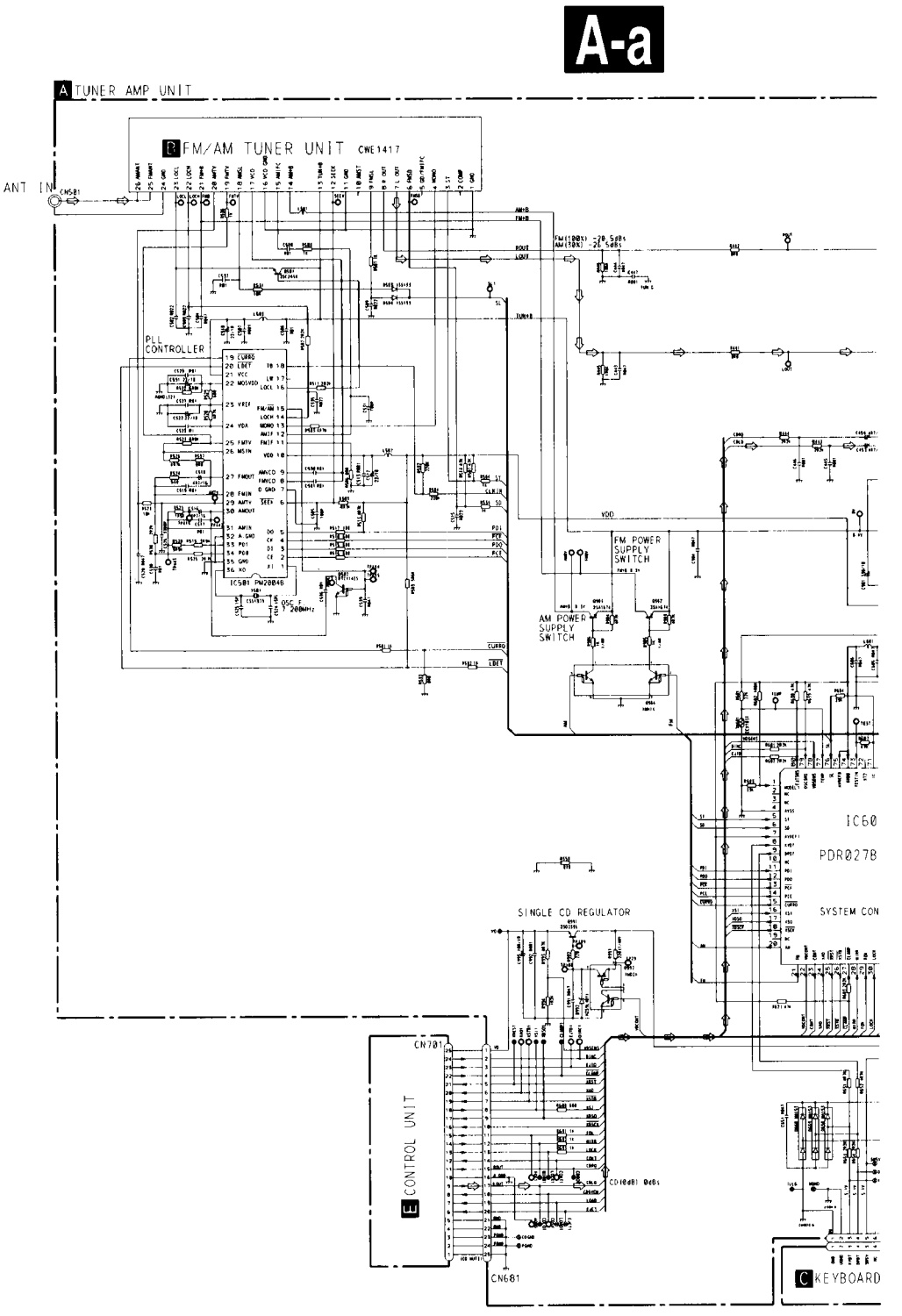

CN681
CN701
VD
DSCSNS
EJTSNS
CLAMP
XRST
XA0
XSTB
XSI
XSO
XSCK
FOK
MIRR
LOCK
CONT
ROUT
AAGND
LOUT
CDSVON
CDLOAD
CDEJET
GND
GND
PGND
PGND
CDMUTE
DGND
AAGND
PGND
VD
GND

Fig. 9

3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)
(DEH-48/X1M/UC)





A-b

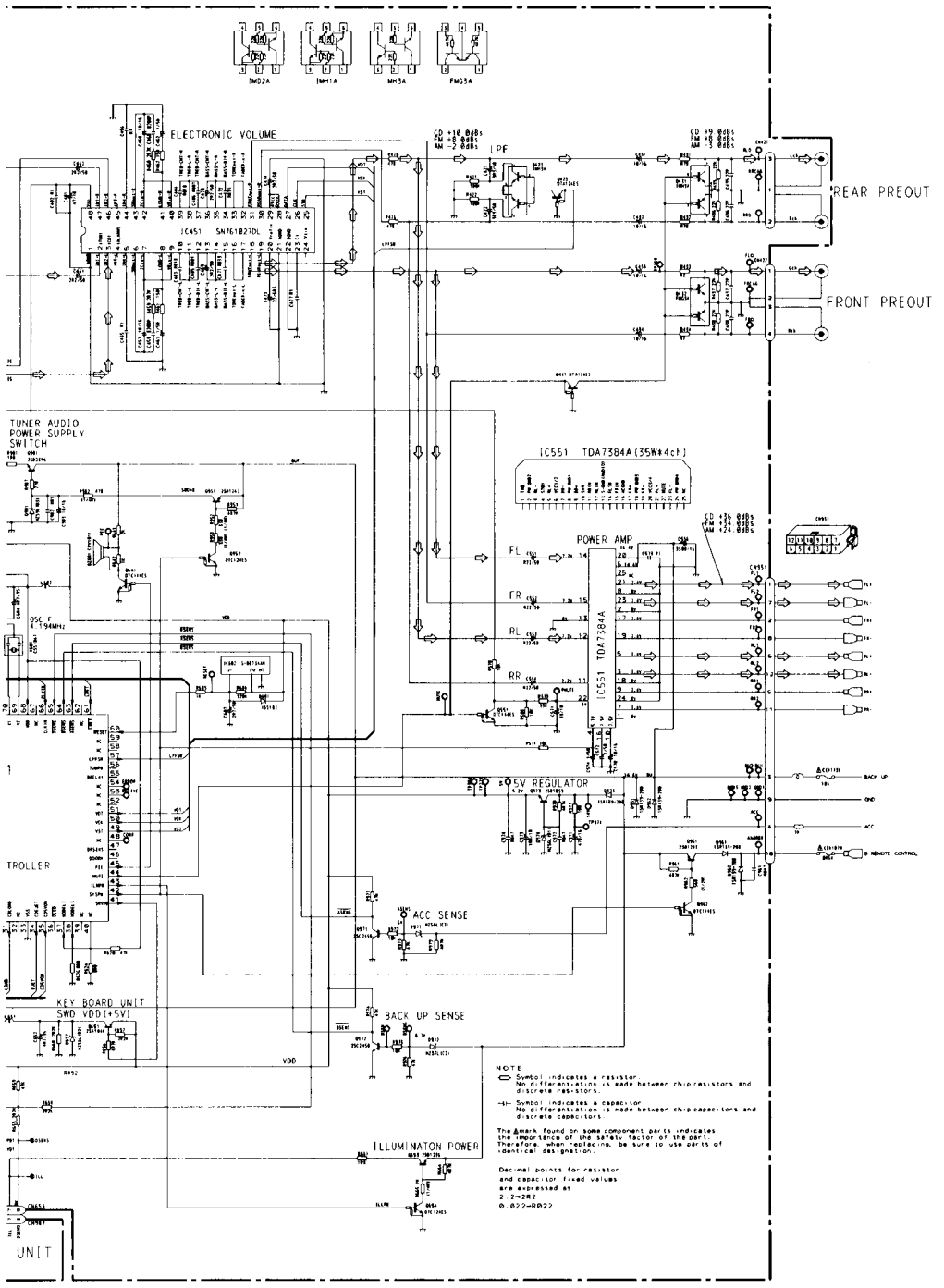
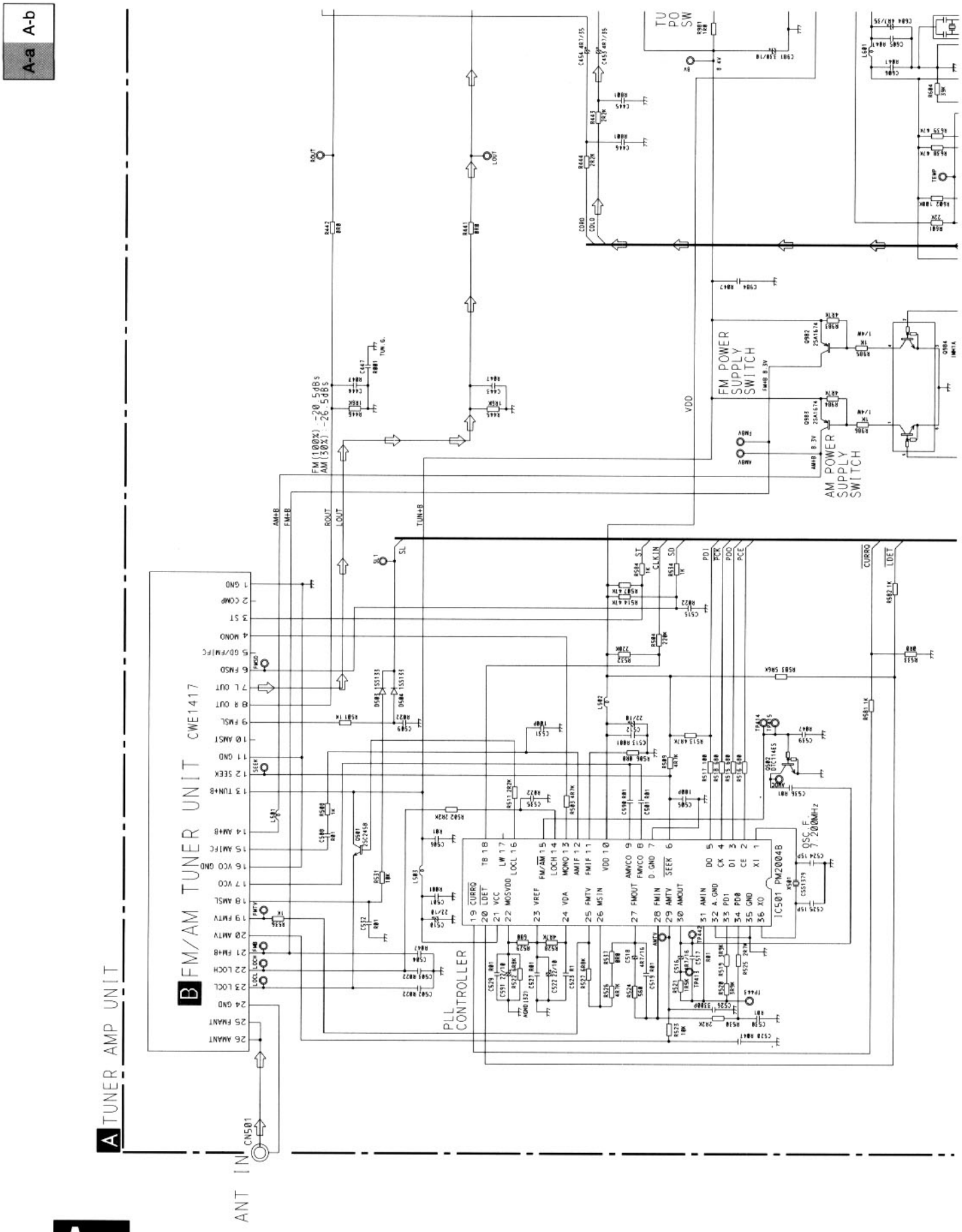
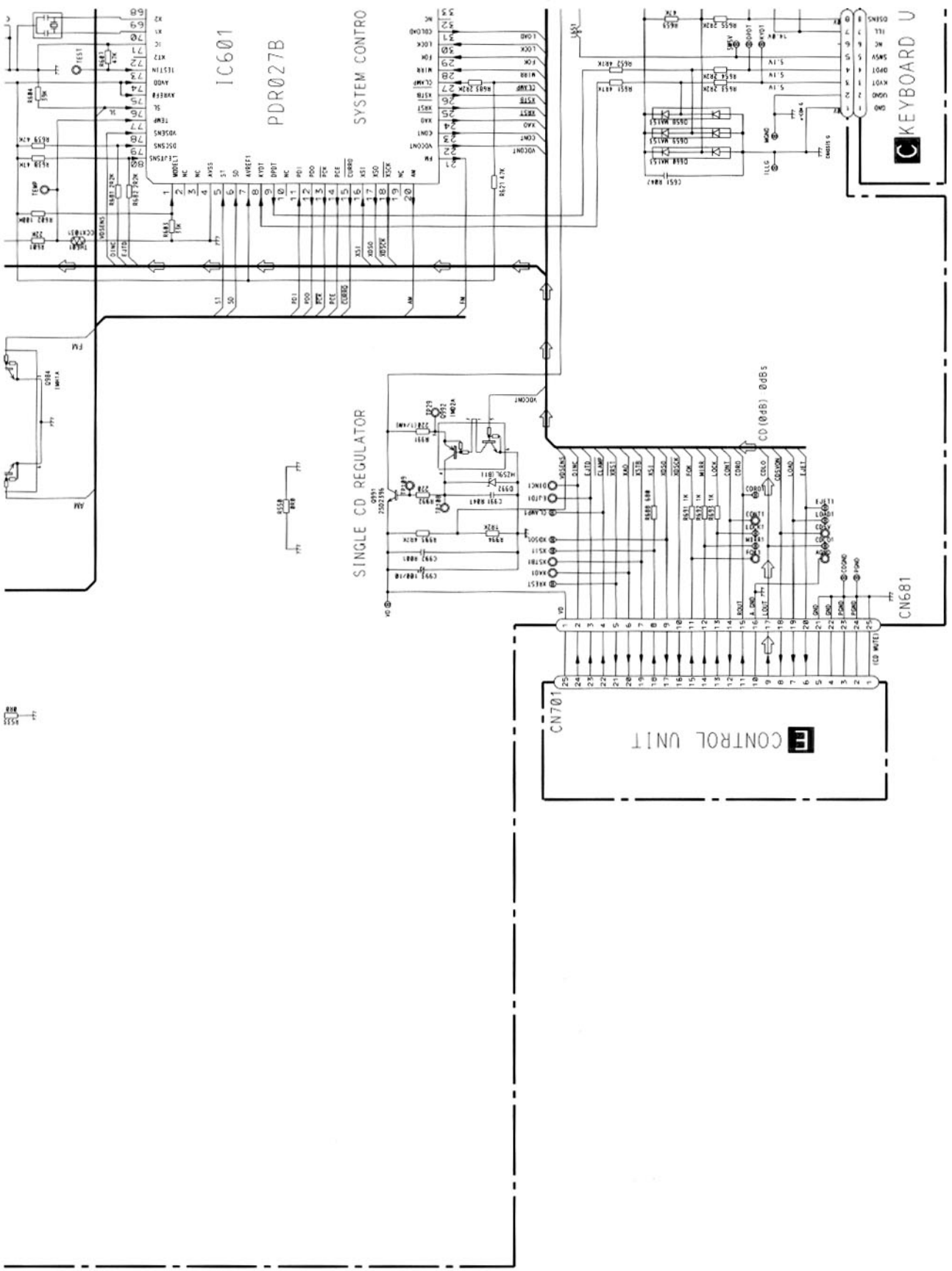

IMD2A
IMH1A
IMH3A
FMG3A
ELECTRONIC VOLUME
LPF
REAR PREOUT
FRONT PREOUT
IC451 SN761827DL
TUNER AUDIO
POWER SUPPLY
SWITCH
IC551 TDA7384A(35W*4ch)
POWER AMP
FL
FR
RL
RR
IC551 TDA7384A
5V REGULATOR
BACK UP
GND
ACC
REMOTE CONTROL
TROLLER
ACC SENSE
KEY BOARD UNIT
SWD VDD(+5V)
BACK UP SENSE
VDD
ILLUMINATON POWER
UNIT
NOTE
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.
The Δmark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.
Decimal points for resistor and capacitor fixed values are expressed as
2.2→2R2
0.022→R022

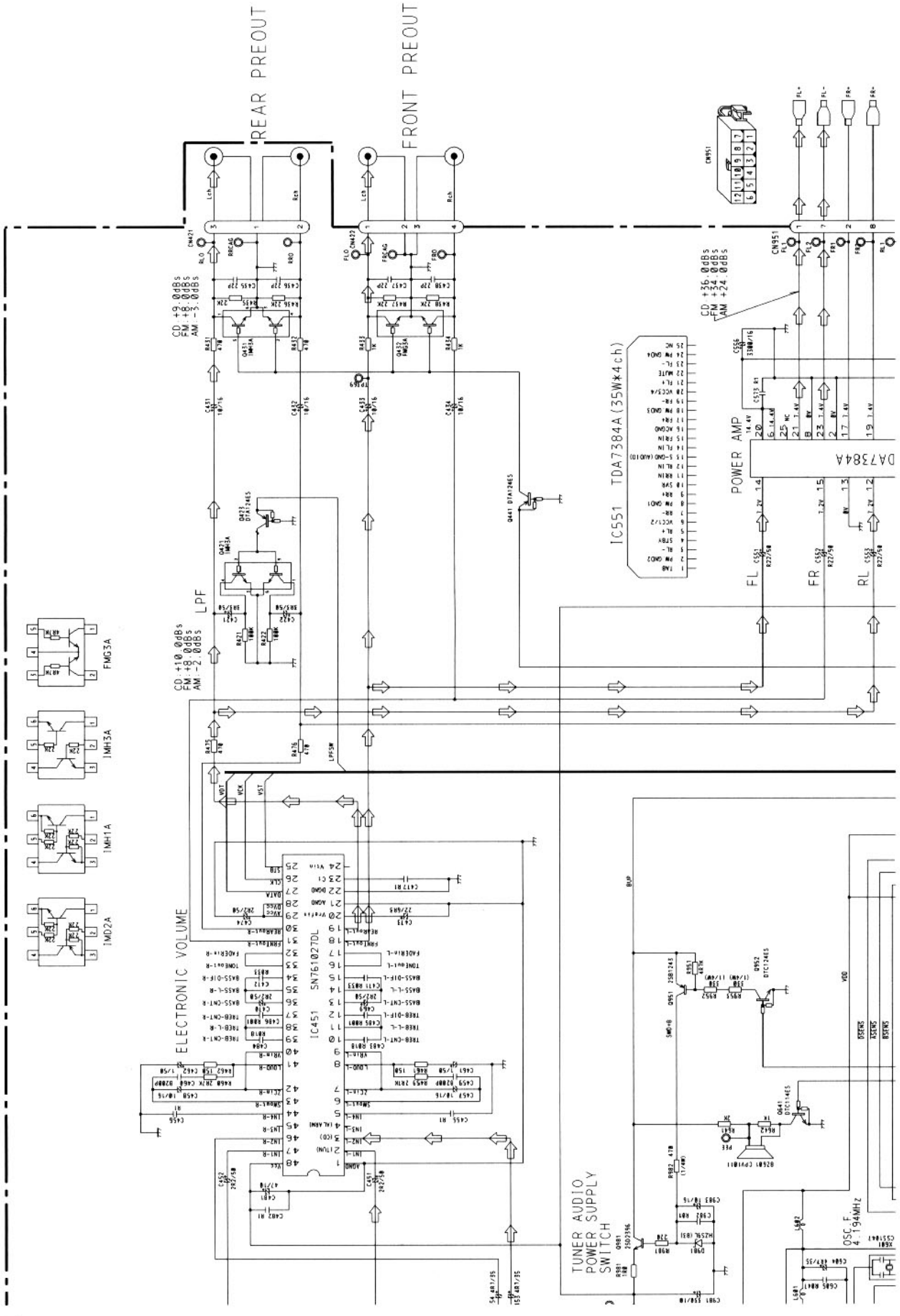
Fig. 10


A-b
A-a
A TUNER AMP UNIT
ANT IN
CN501
B FM/AM TUNER UNIT CWE1417
PLL CONTROLLER
IC501 PM2004B
FM POWER SUPPLY SWITCH
AM POWER SUPPLY SWITCH
TU PO SW
VDD
ROUT
LOUT
AM+B
FM+B
TUN+B
CURRQ
LDET
FM(100%) -20.5dBs
AM(30%) -26.5dBs


IC601
PDR027B
SYSTEM CONTRO
KEYBOARD U
SINGLE CD REGULATOR
CD(0dB) 0dBs
CN681
CN701
CONTROL UNIT

A-b
A-a

Fig. 11


REAR PREOUT
FRONT PREOUT
IC551 TDA7384A(35W*4ch)
POWER AMP
DA7384A
FL
FR
RL
LPF
ELECTRONIC VOLUME
IC451 SN761027DL
TUNER AUDIO POWER SUPPLY
FMG3A
IMH3A
IMH1A
IMD2A

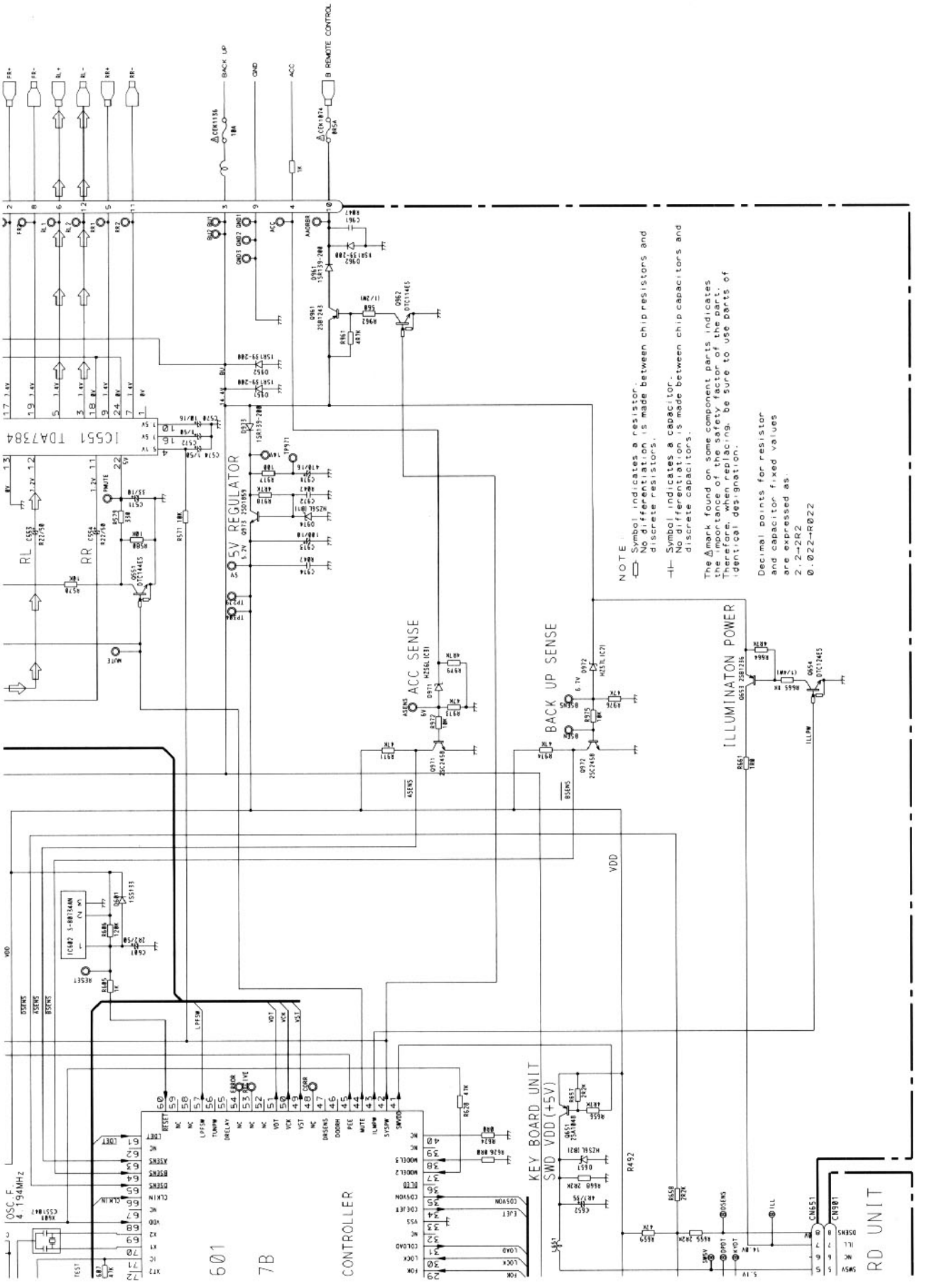
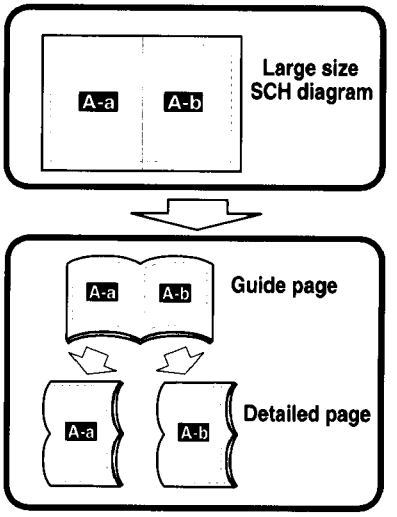
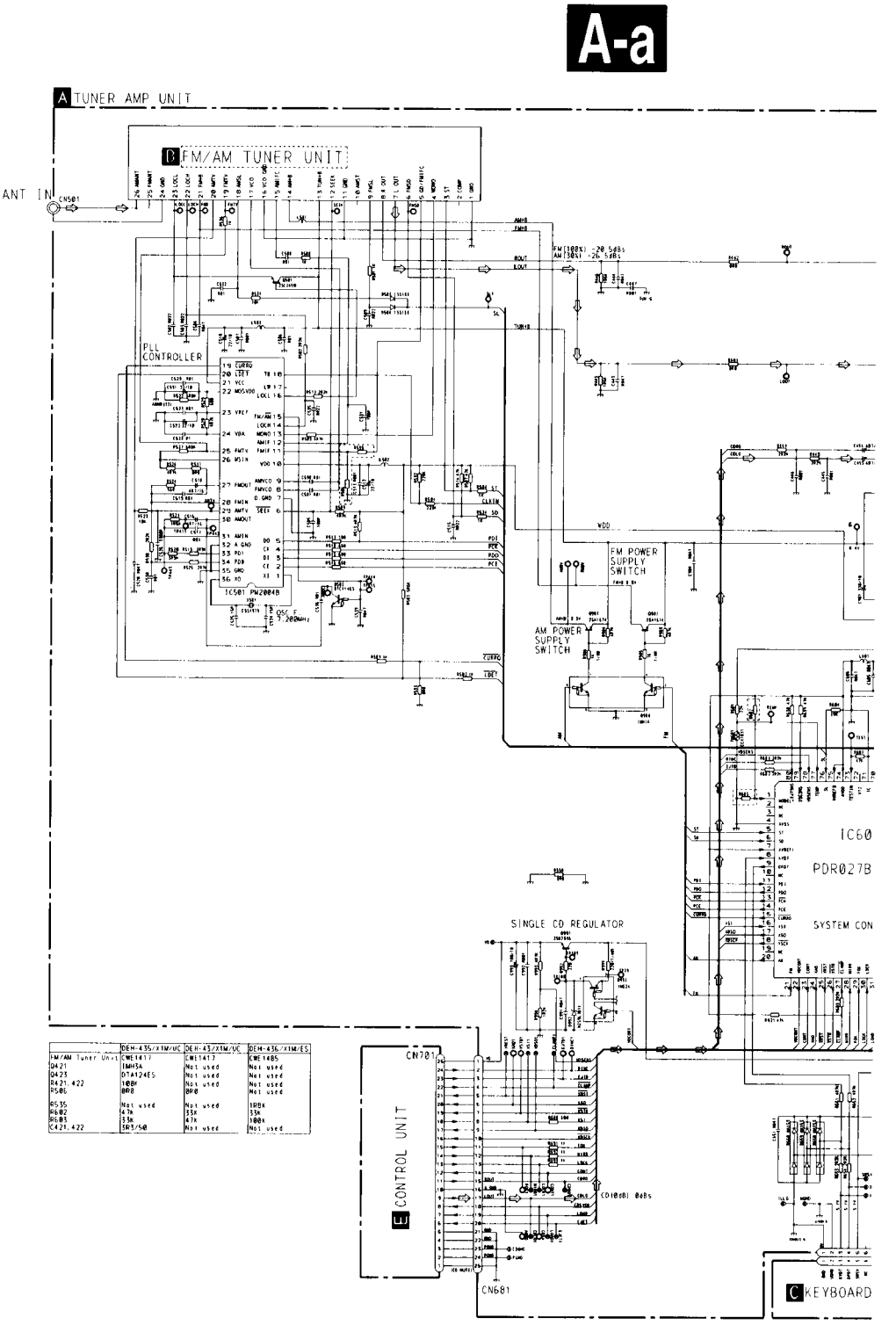

NOTE
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.
The Δmark found on some component parts indicates the importance of the safety factor of the parts.
Therefore when replacing, be sure to use parts of identical designation.
Decimal points for resistor and capacitor fixed values are expressed as.
2.2→2R2
0.022→R022
IC551 TDA7384
5V REGULATOR
ACC SENSE
BACK UP SENSE
ILLUMINATON POWER
KEY BOARD UNIT
SWD VDD(+5V)
CONTROLLER
601
7B
RD UNIT
OSC.F
4.194MHz
RL
RR
VDD
R492
BACK UP
GND
ACC
B REMOTE CONTROL

Fig. 12

3.3 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)
(DEH-435/X1M/UC, 43/X1M/UC, 436/X1M/ES)





A-b

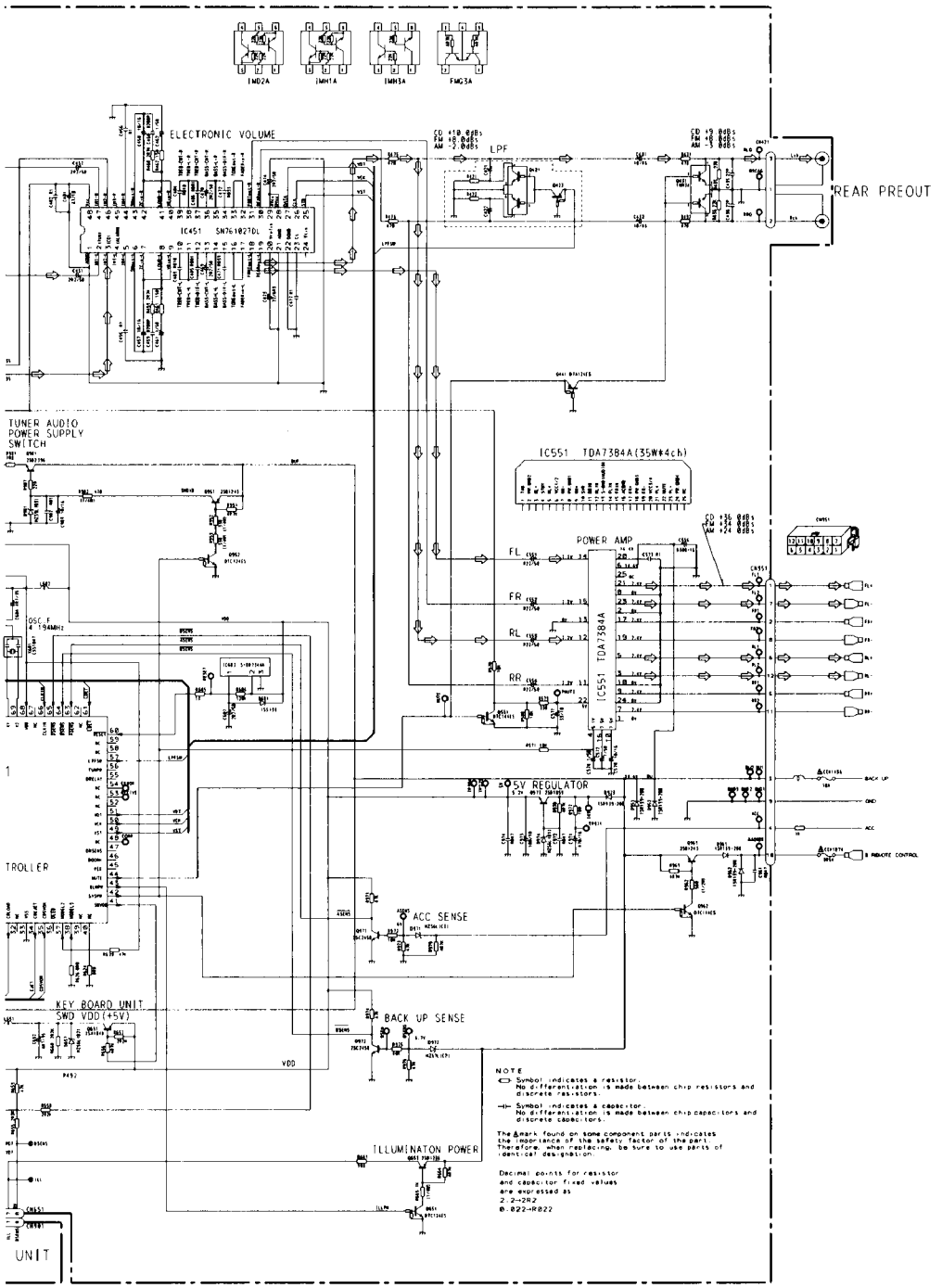
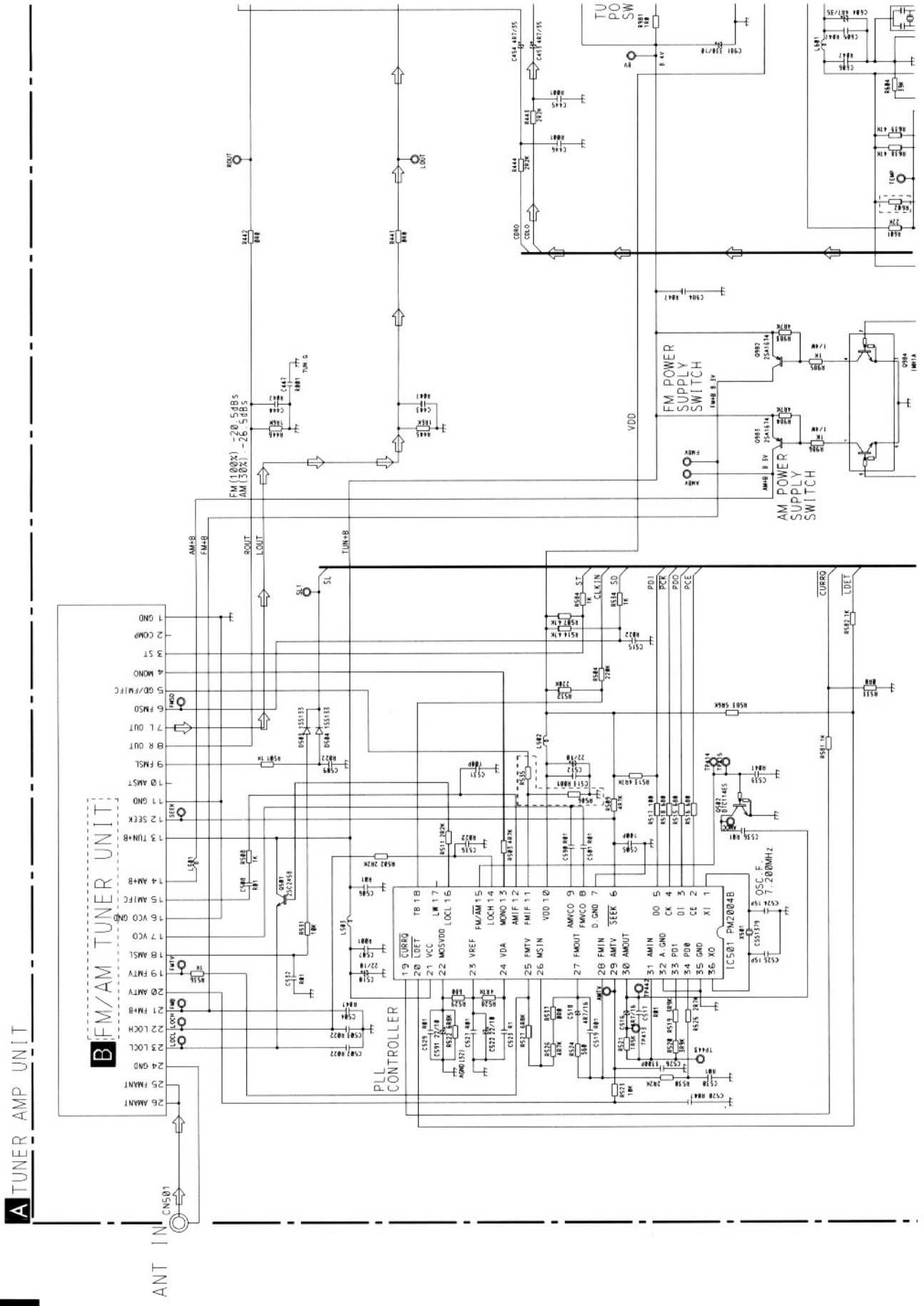
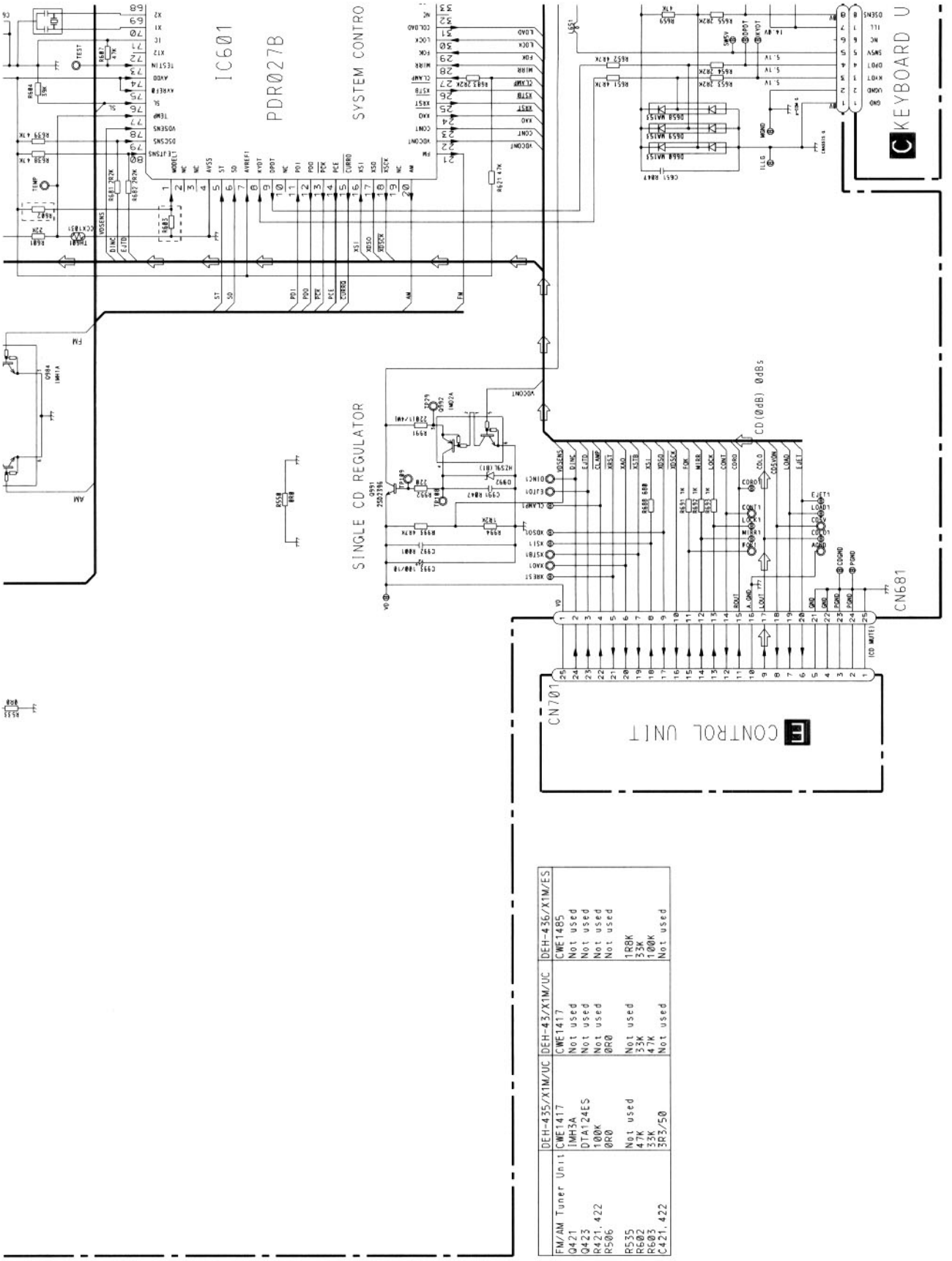

IMD2A
IMH1A
IMH3A
FMG3A
ELECTRONIC VOLUME
LPF
REAR PREOUT
IC451 SN761027DL
TUNER AUDIO
POWER SUPPLY
SWITCH
IC551 TDA7384A(35W*4ch)
POWER AMP
FL
FR
RL
RR
IC551 TDA7384A
5V REGULATOR
TROLLER
ACC SENSE
KEY BOARD UNIT
SWD VDD(+5V)
BACK UP SENSE
VDD
ILLUMINATON POWER
UNIT
NOTE
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.
The ▲mark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.
Decimal points for resistor and capacitor fixed values are expressed as
2.2→2R2
0.022→R022

Fig. 13

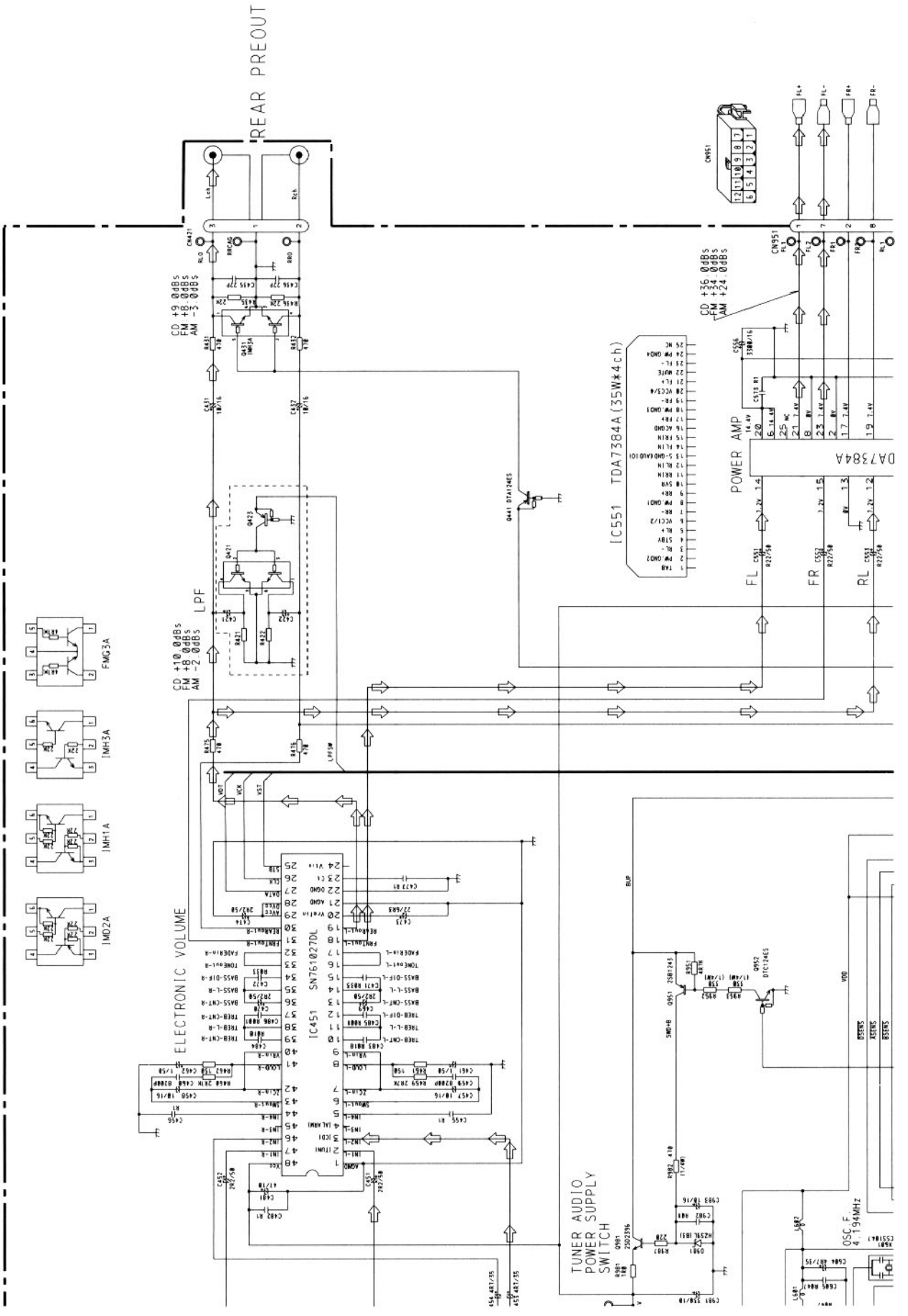

A TUNER AMP UNIT
B FM/AM TUNER UNIT
ANT IN CN501
PLL CONTROLLER
IC501 PM2004B
OSC.F. 7.200MHz
FM POWER SUPPLY SWITCH
AM POWER SUPPLY SWITCH
FM(100%) -20.5dBs
AM(30%) -26.5dBs
ROUT
LOUT
TUN+B
AM+B
FM+B
VDD
SL
SEEK
CURRQ
LOET
1 GND
2 COMP
3 ST
4 MONO
5 GD/FMIFC
6 FMSO
7 L OUT
8 R OUT
9 FMSL
10 AMST
11 GND
12 SEEK
13 TUN+B
14 AM+B
15 AMIFC
16 VCO GND
17 VCO
18 AMSL
19 FMTV
20 AMTV
21 FM+B
22 LOCH
23 LOCL
24 GND
25 FANT
26 AANT



	DEH-435/X1M/UC	DEH-43/X1M/UC	DEH-436/X1M/ES
FM/AM Tuner Unit	CWE1417	CWE1417	CWE1485
Q421	1MH3A	Not used	Not used
Q423	DTA124ES	Not used	Not used
R421.422	100K	Not used	Not used
R506	0R0	0R0	Not used
R535	Not used	Not used	1R8K
R602	47K	33K	33K
R603	33K	47K	100K
C421.422	3R3/50	Not used	Not used

Fig. 14

A-a A-b


REAR PREOUT
CD +9.0dBs
FM +8.0dBs
AM -5.0dBs
CD +10.0dBs
FM +8.0dBs
AM -2.0dBs
LPF
ELECTRONIC VOLUME
IC451 SN761027DL
IC551 TDA7384A(35W*4ch)
POWER AMP
DA7384A
CD +36.0dBs
FM +26.0dBs
AM +24.0dBs
FL
FR
RL
FWG3A
IMH3A
IMH1A
IMD2A
TUNER AUDIO
POWER SUPPLY
SWITCH
OSC F
4.194MHz

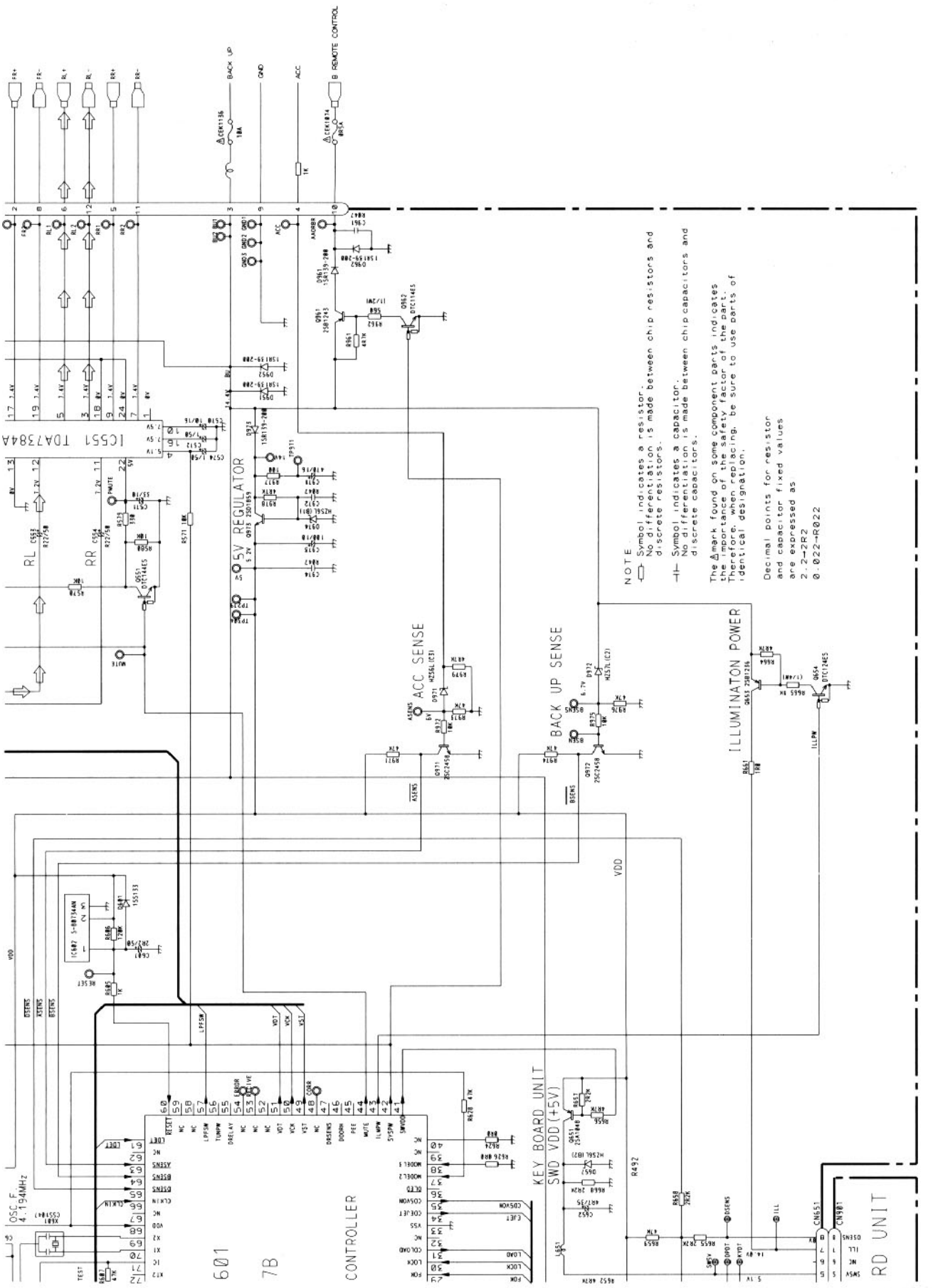
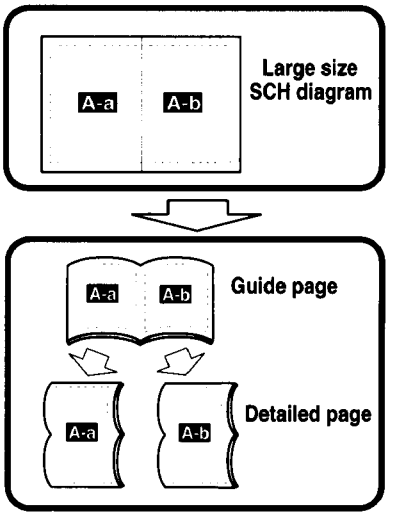
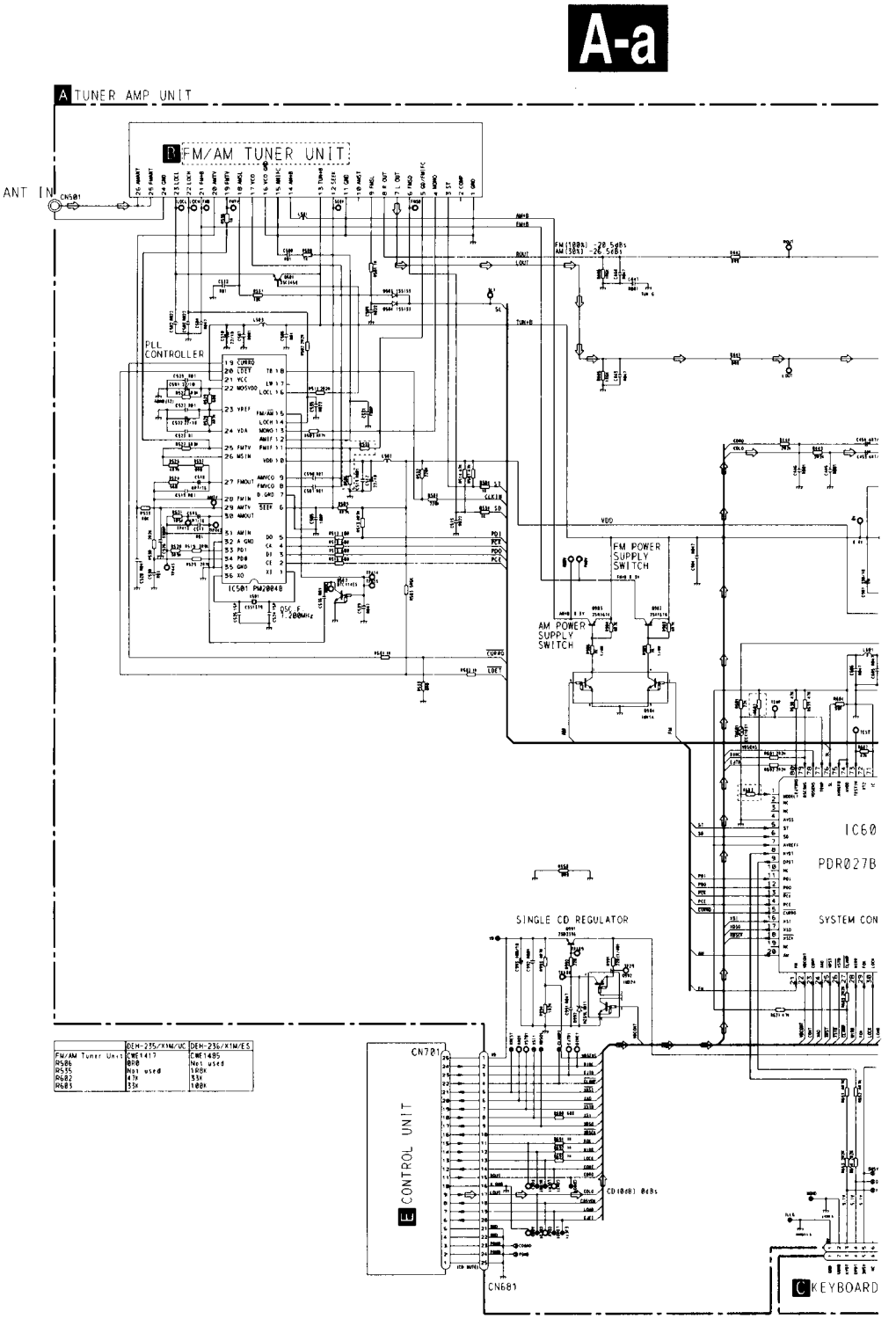

FR+
FR-
RL+
RL-
RR+
RR-
BACK UP
GND
ACC
B REMOTE CONTROL
IC551 TDA7384A
5V REGULATOR
ACC SENSE
BACK UP SENSE
ILLUMINATON POWER
KEY BOARD UNIT
SWD VDD(+5V)
CONTROLLER
RD UNIT
OSC.F
4.194MHz
VDD
NOTE
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.
The Δ mark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.
Decimal points for resistor and capacitor fixed values are expressed as
2.2→2R2
0.022→R022

Fig. 15

3.4 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)
(DEH-235/X1M/UC, 236/X1M/ES)





A-b

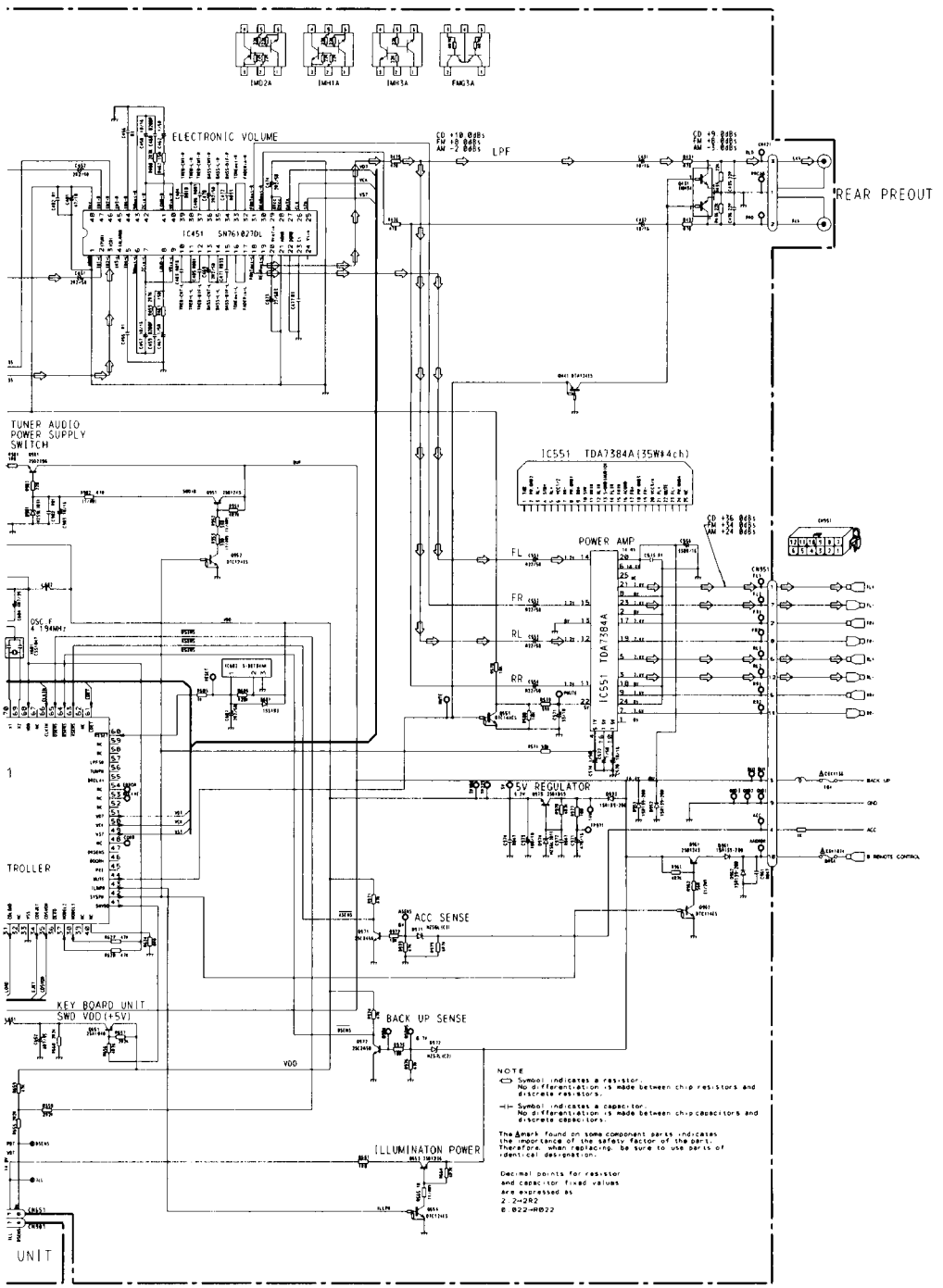
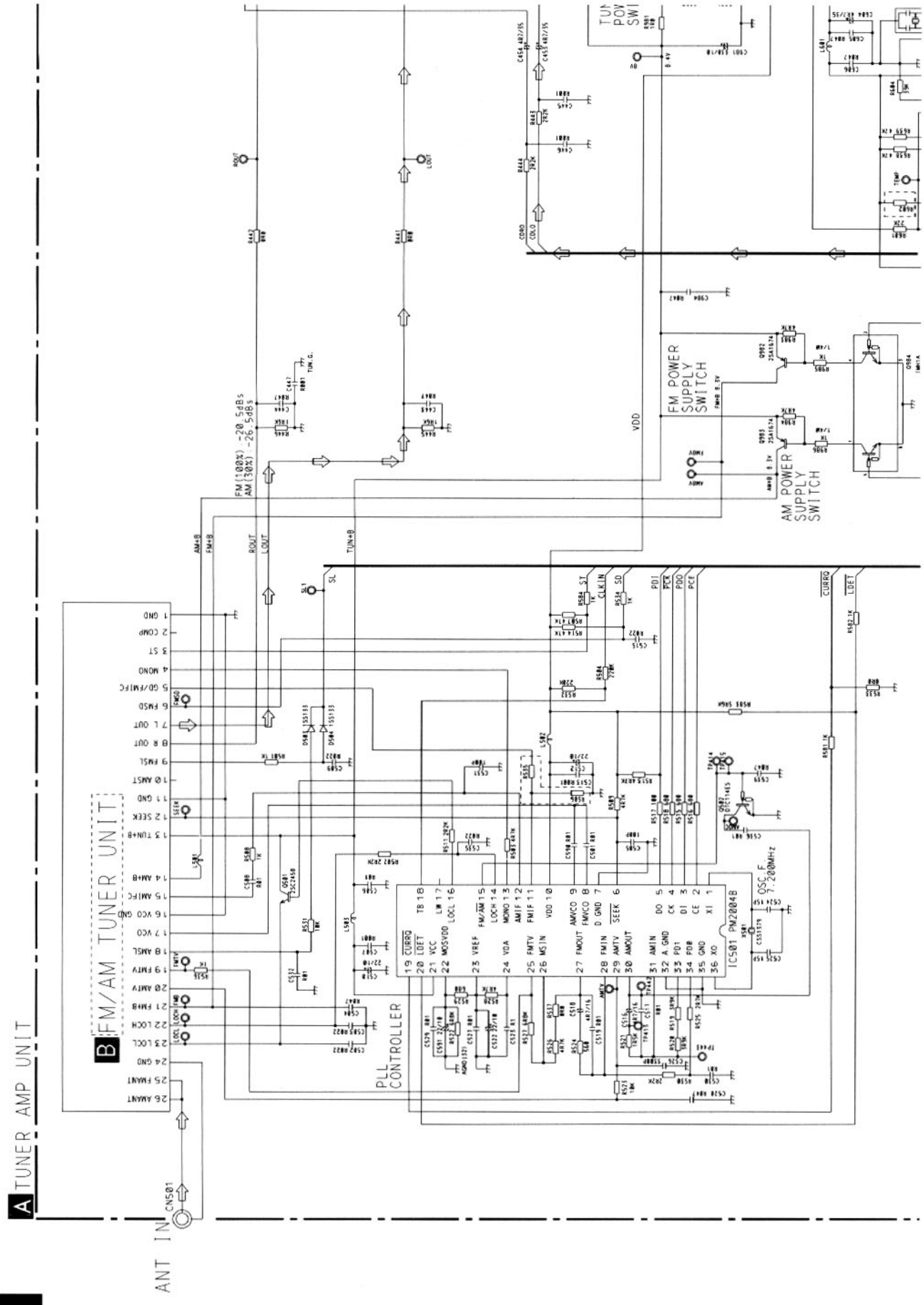
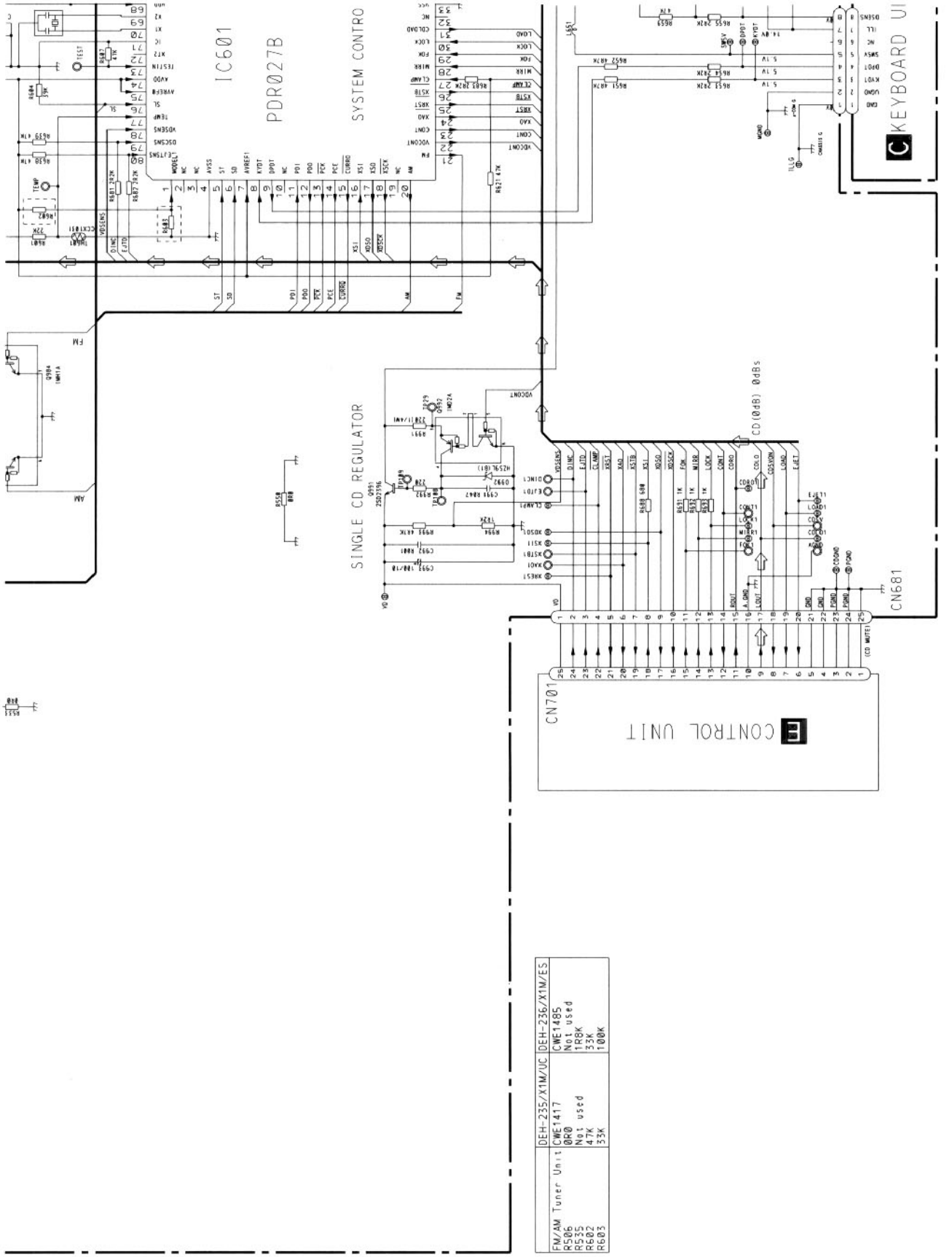

IMD2A
IMH1A
IMH3A
FMG3A
ELECTRONIC VOLUME
IC451 SW761027DL
LPF
REAR PREOUT
TUNER AUDIO
POWER SUPPLY
SWITCH
IC551 TDA7384A(35W4ch)
POWER AMP
FL
FR
RL
RR
IC551 TDA7384A
5V REGULATOR
ACC SENSE
BACK UP SENSE
KEY BOARD UNIT
SWD VDD(+5V)
VDD
ILLUMINATON POWER
TROLLER
UNIT
BACK UP
GND
ACC
REMOTE CONTROL
NOTE
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.
The Δmark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.
Decimal points for resistor and capacitor fixed values are expressed as
2.2=2R2
0.022=R022

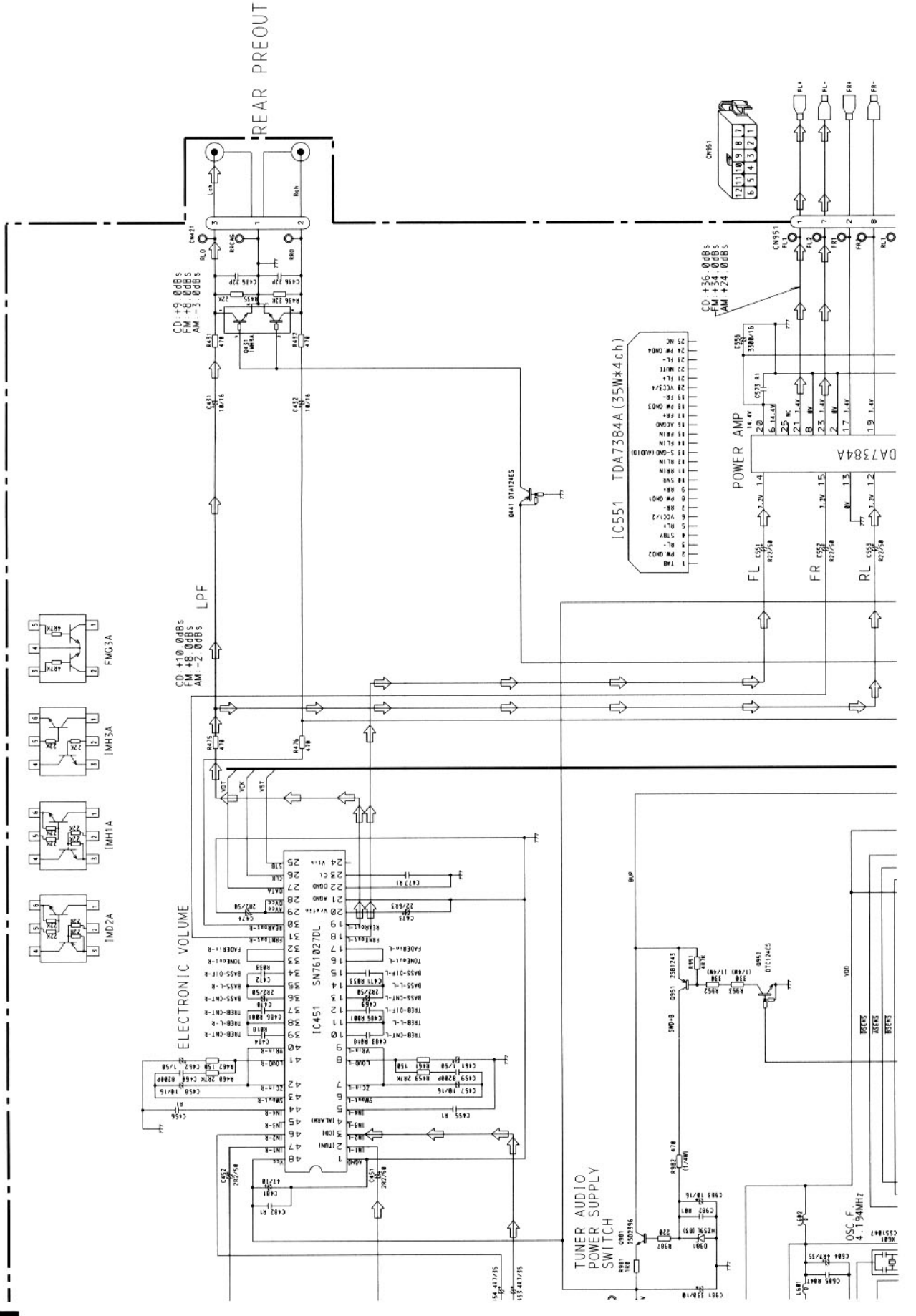
Fig. 16


A TUNER AMP UNIT
B FM/AM TUNER UNIT
ANT IN
CN501
PLL CONTROLLER
ICS01 PW2004B
FM POWER SUPPLY SWITCH
AM POWER SUPPLY SWITCH
VDD
FM(100%) -20.5dBs
AM(30%) -26.5dBs



	DEH-235/X1M/UC	DEH-236/X1M/ES
FM/AM Tuner Unit	CWE1417	CWE1485
R506	0R0	Not used
R535	Not used	180K
R602	47K	33K
R603	33K	100K

Fig. 17


REAR PREOUT
CD +9.0dBs
FM +0.0dBs
AM -3.0dBs
CD +10.0dBs
FM +8.0dBs
AM -2.0dBs
LPF
ELECTRONIC VOLUME
IC451 SN761027DL
IC551 TDA7384A(35W×4ch)
POWER AMP
DA7384A
CD +36.0dBs
FM +34.0dBs
AM +24.0dBs
FL
FR
RL
FMG3A
IMH3A
IMH1A
IMD2A
TUNER AUDIO
POWER SUPPLY
SWITCH
OSC F
4.194MHz

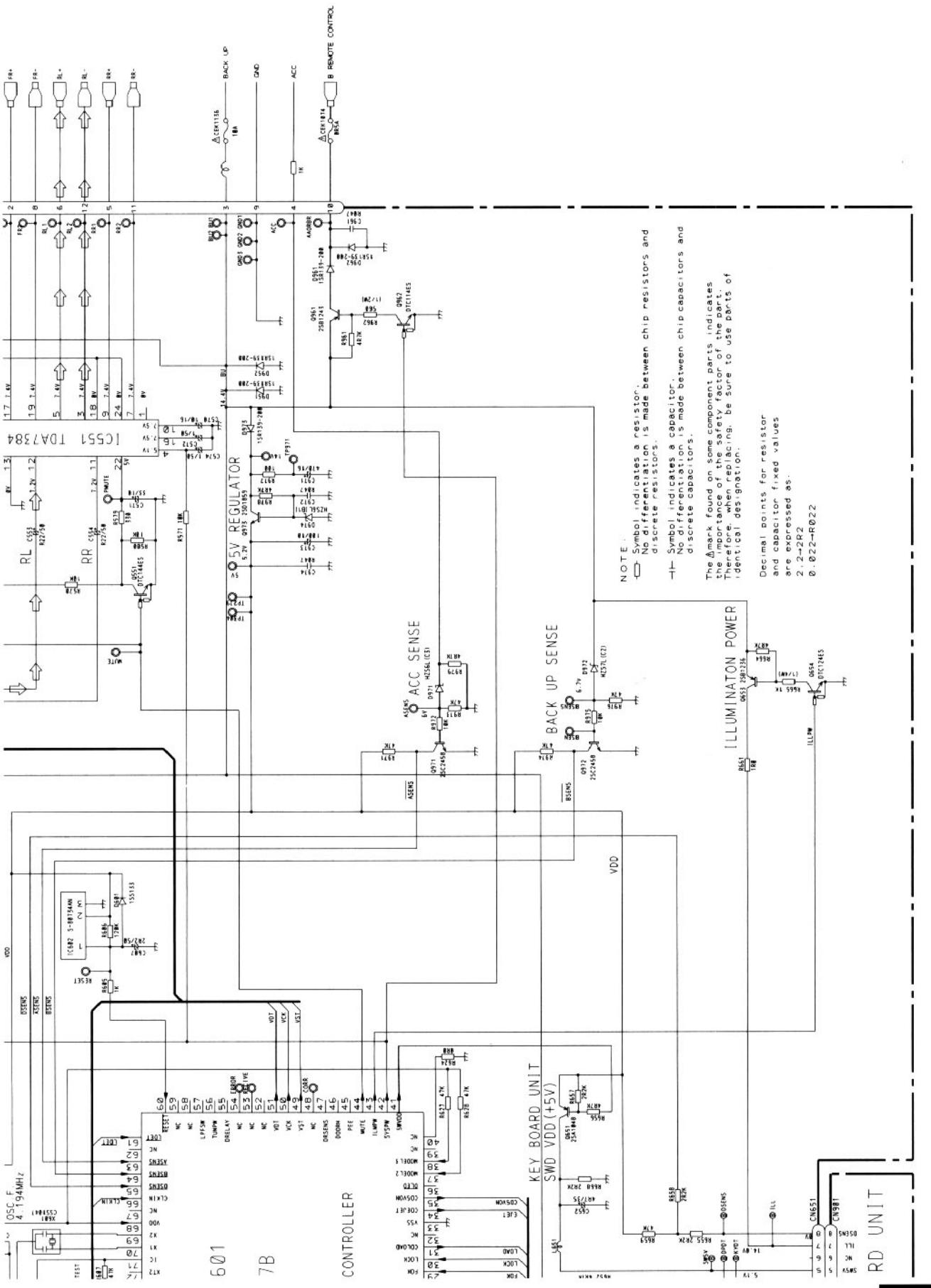
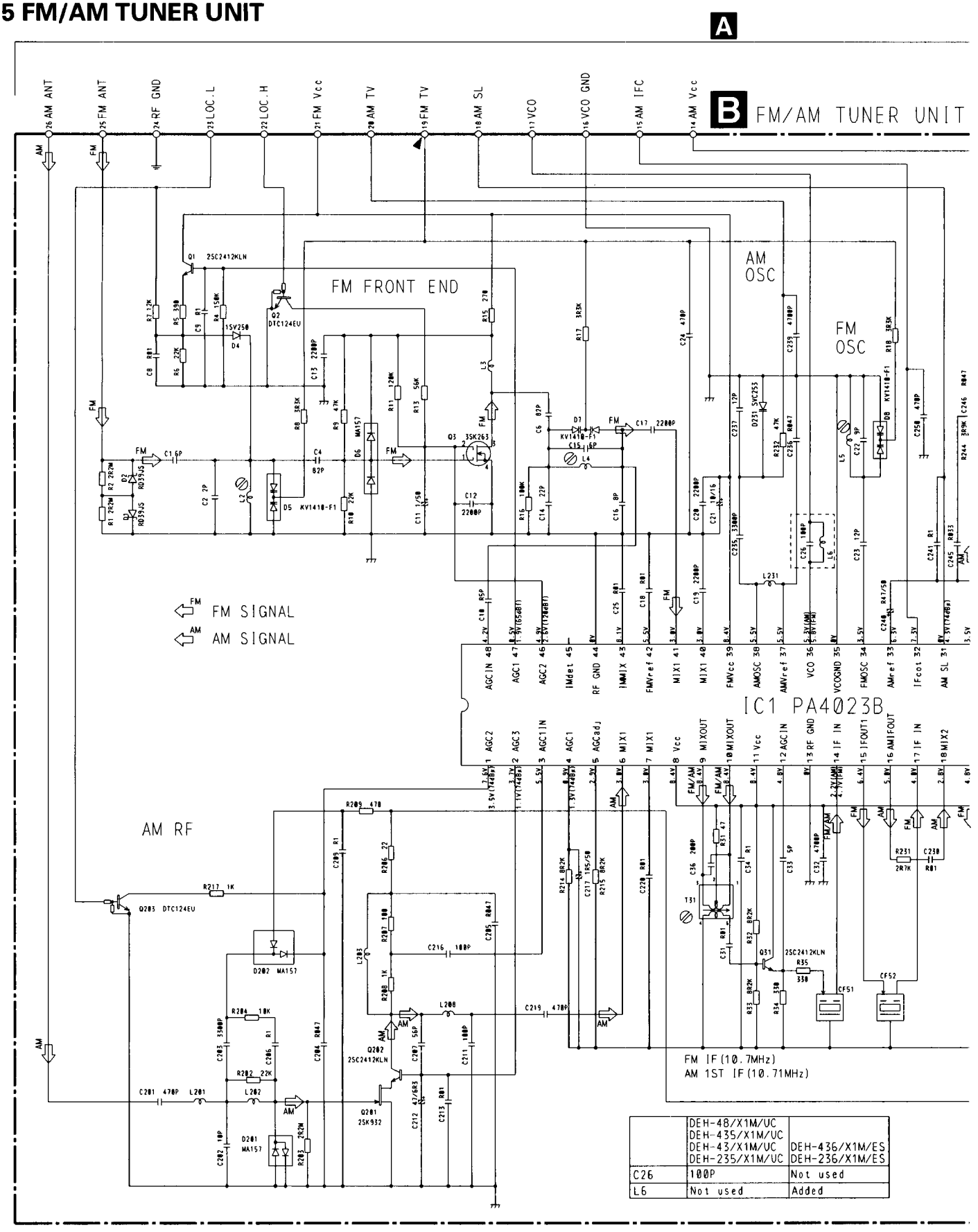

FR+
FR-
RL+
RL-
RR+
RR-
BACK UP
GND
ACC
B REMOTE CONTROL
IC551 TDA7384
RL
RR
5V REGULATOR
ACC SENSE
BACK UP SENSE
ILLUMINATON POWER
NOTE:
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.
The Δmark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.
Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022
VDD
KEY BOARD UNIT
SWD VDD(+5V)
CONTROLLER
601
7B
OSC F
4.194MHz
RD UNIT

Fig. 18

3.5 FM/AM TUNER UNIT



	DEH-48/X1M/UC DEH-435/X1M/UC DEH-43/X1M/UC DEH-235/X1M/UC	DEH-436/X1M/ES DEH-236/X1M/ES
C26	100P	Not used
L6	Not used	Added

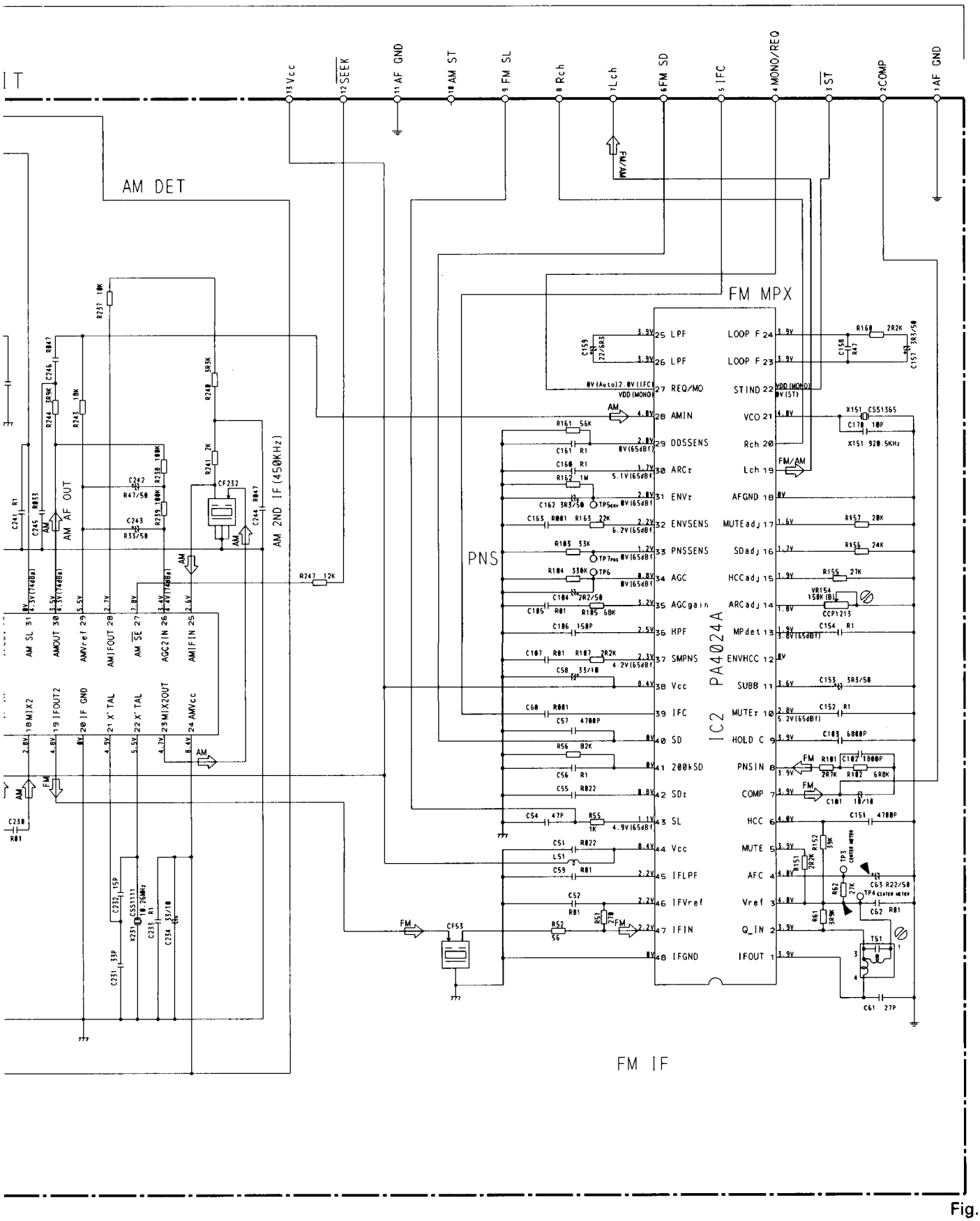
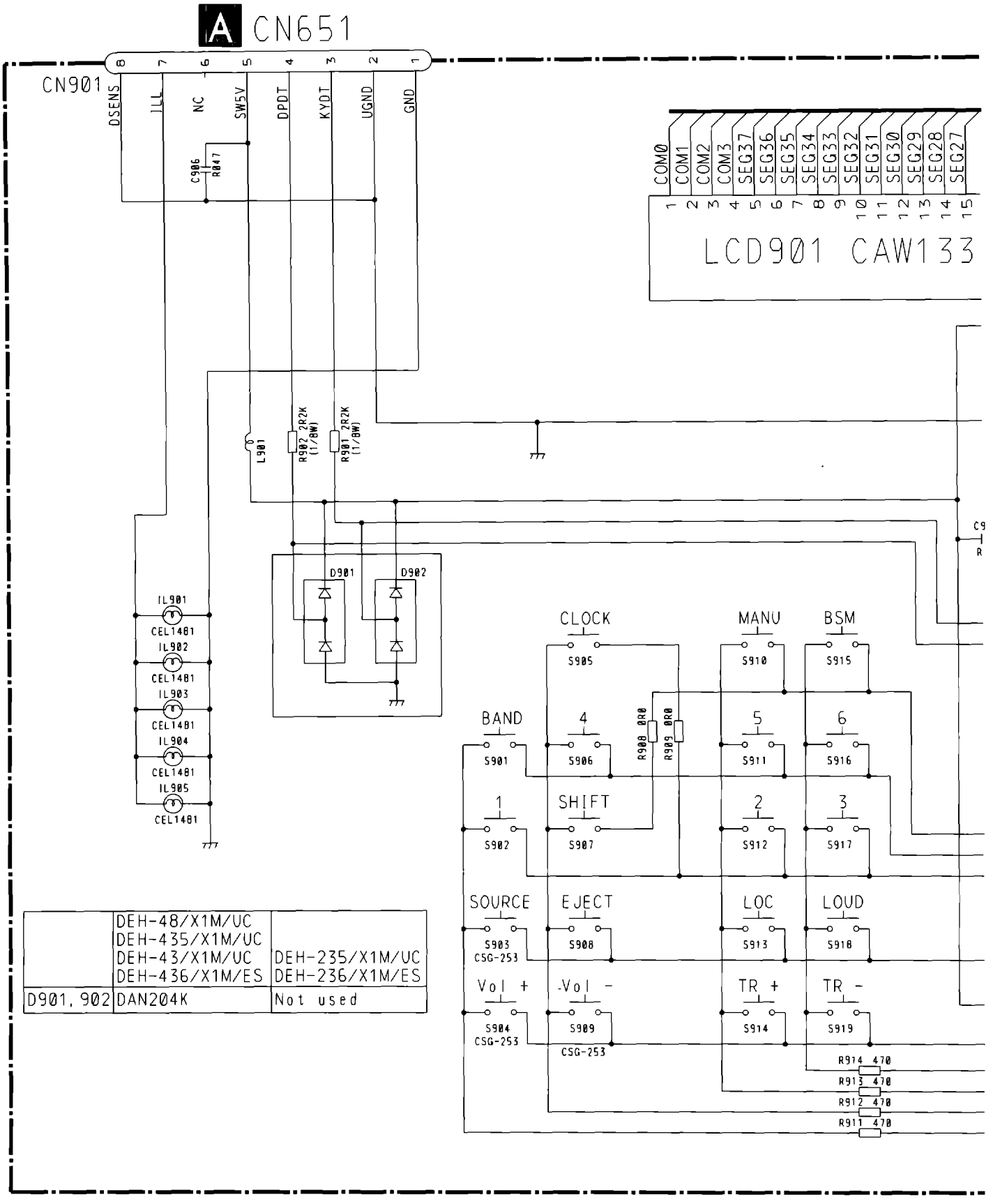

AM DET
FM MPX
PNS
IC2 PA4024A
FM IF
AM AF OUT
AM 2ND IF (450KHz)
13 Vcc
12 SEEK
11 AF GND
10 AM ST
9 FM SL
8 Rch
7 Lch
6 FM SD
5 IFC
4 MONO/REQ
3 ST
2 COMP
1 AF GND
25 LPF
26 LPF
27 REQ/MO
28 AMIN
29 DDSSENS
30 ARCτ
31 ENVτ
32 ENVSENS
33 PNSSENS
34 AGC
35 AGCgain
36 HPF
37 SMPNS
38 Vcc
39 IFC
40 SD
41 200kSD
42 SDτ
43 SL
44 Vcc
45 IFLPF
46 IFVref
47 IFIN
48 IFGND
24 AMVcc
23 MIX2OUT
22 X' TAL
21 X' TAL
20 IF GND
19 IFOUT2
18 MIX2
LOOP F 24
LOOP F 23
STIND 22
VCO 21
Rch 20
Lch 19
AFGND 18
MUTEadj 17
SDadj 16
HCCadj 15
ARCadj 14
MPdet 13
ENVHCC 12
SUBB 11
MUTEr 10
HOLD C 9
PNSIN 8
COMP 7
HCC 6
MUTE 5
AFC 4
Vref 3
Q_IN 2
IFOUT 1
AM SL 31
AMOUT 30
AMVref 29
AMIFOUT 28
AM SE 27
AGC2IN 26
AMIFIN 25
CF232
CF53
X151 CS51365
X151 920.5KHz
X231 CS51111
TS1
TP3
TP4
TP5rev
TP6
TP7pos

Fig. 19

3.6 KEYBOARD UNIT



	DEH-48/X1M/UC DEH-435/X1M/UC DEH-43/X1M/UC DEH-436/X1M/ES	DEH-235/X1M/UC DEH-236/X1M/ES
D901, 902	DAN204K	Not used

C KEYBOARD UNIT

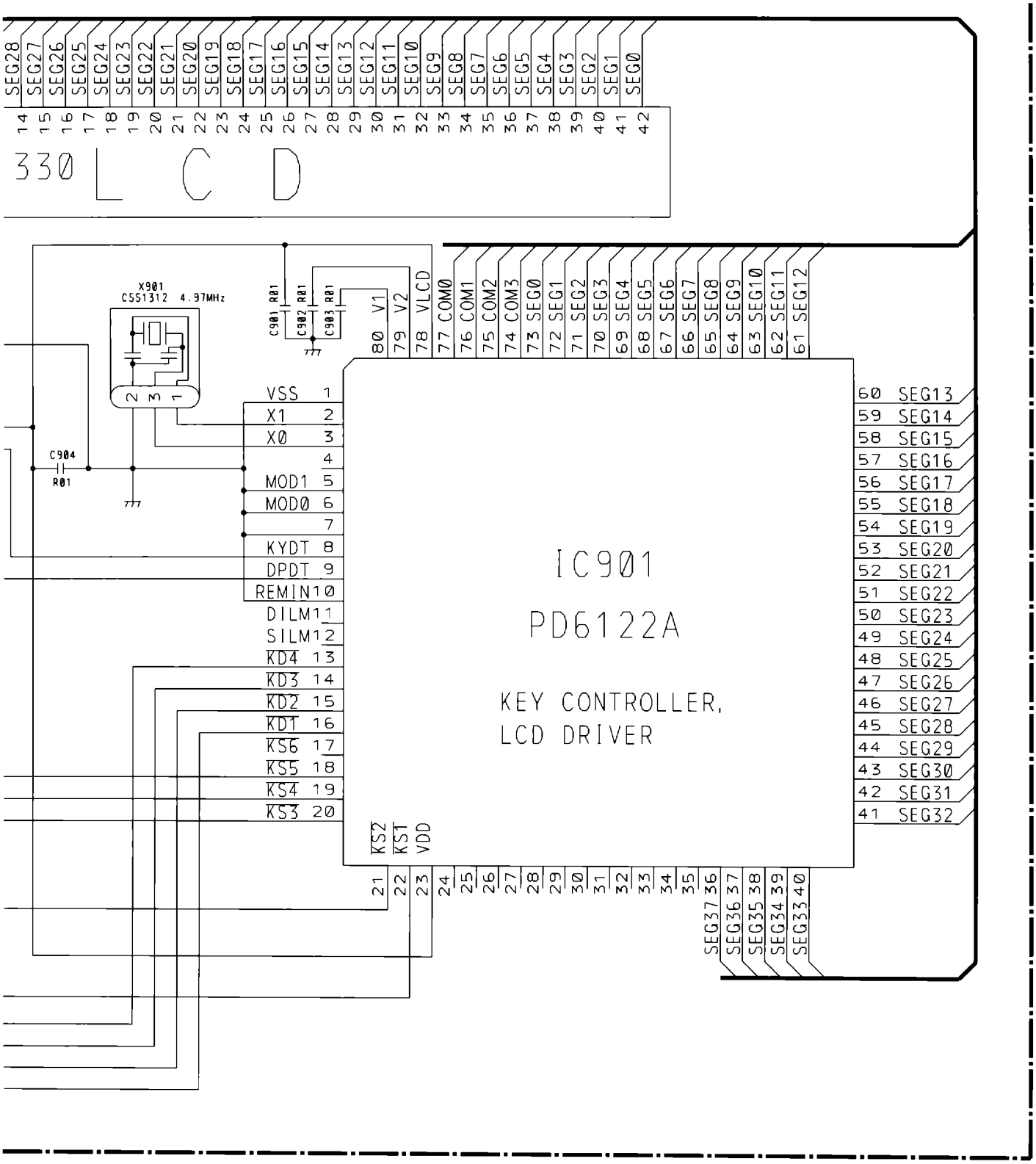


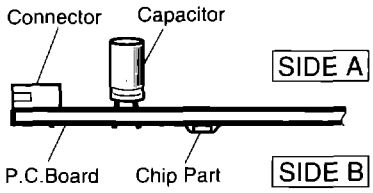
Fig. 20

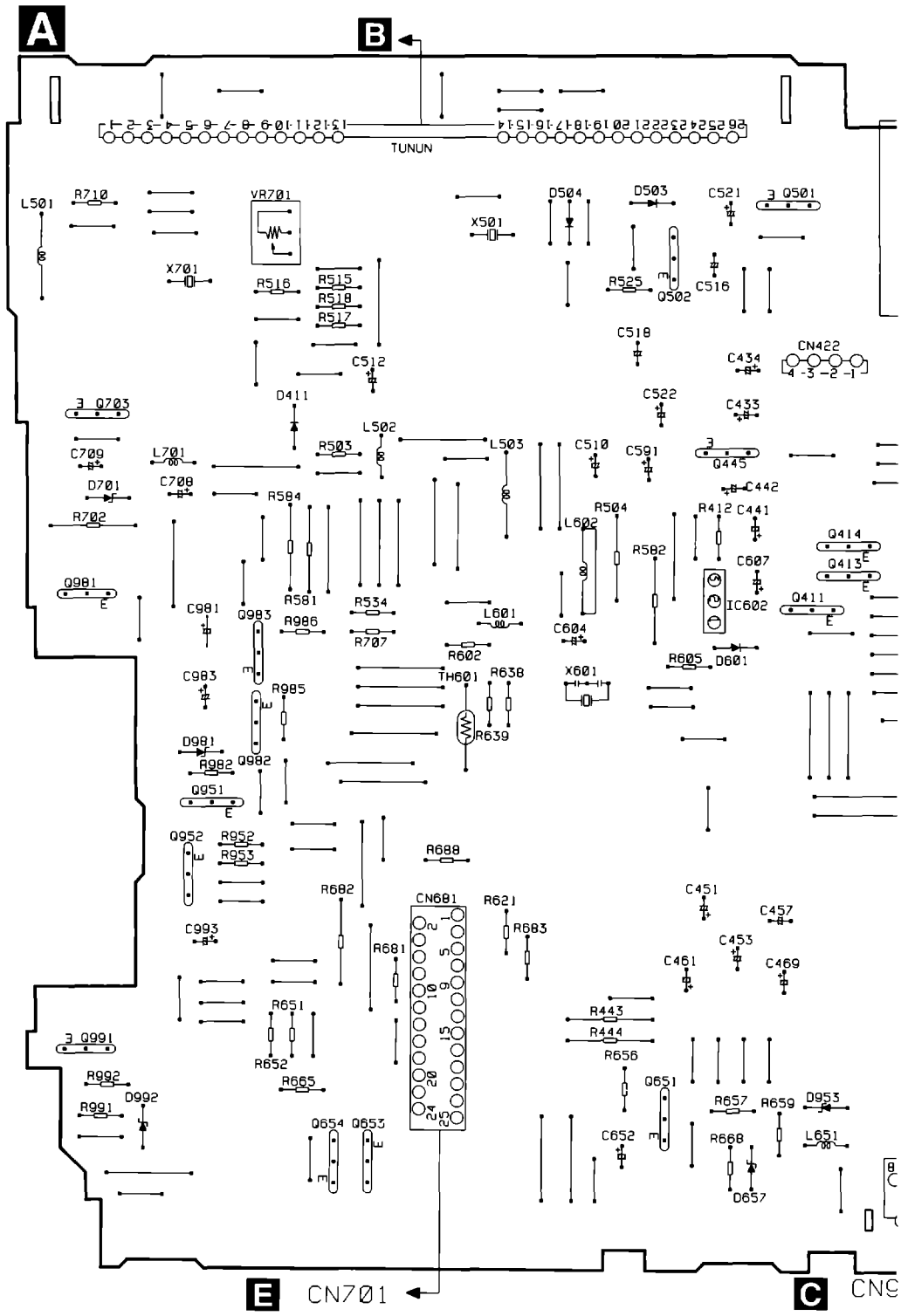
4. PCB CONNECTION DIAGRAM

4.1 TUNER AMP UNIT

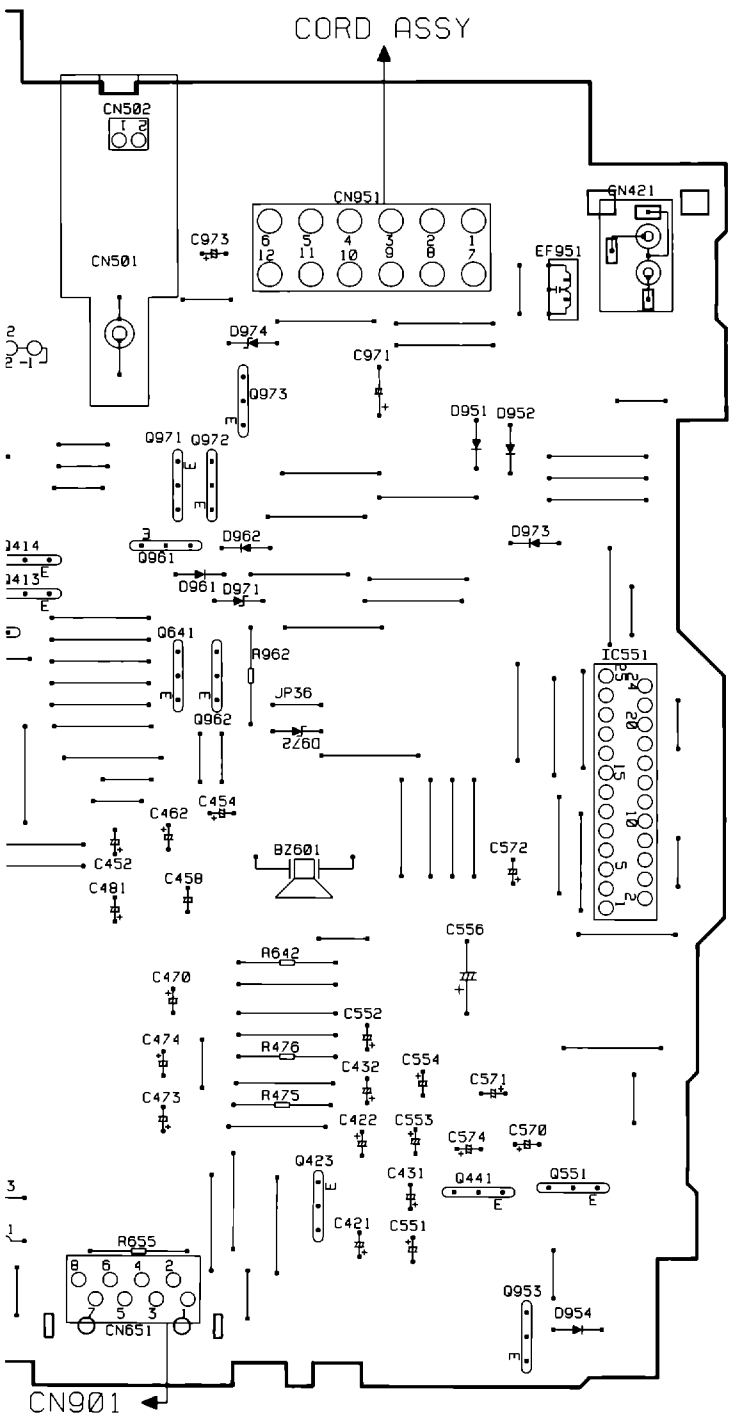
NOTE FOR PCB DIAGRAMS

1. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams



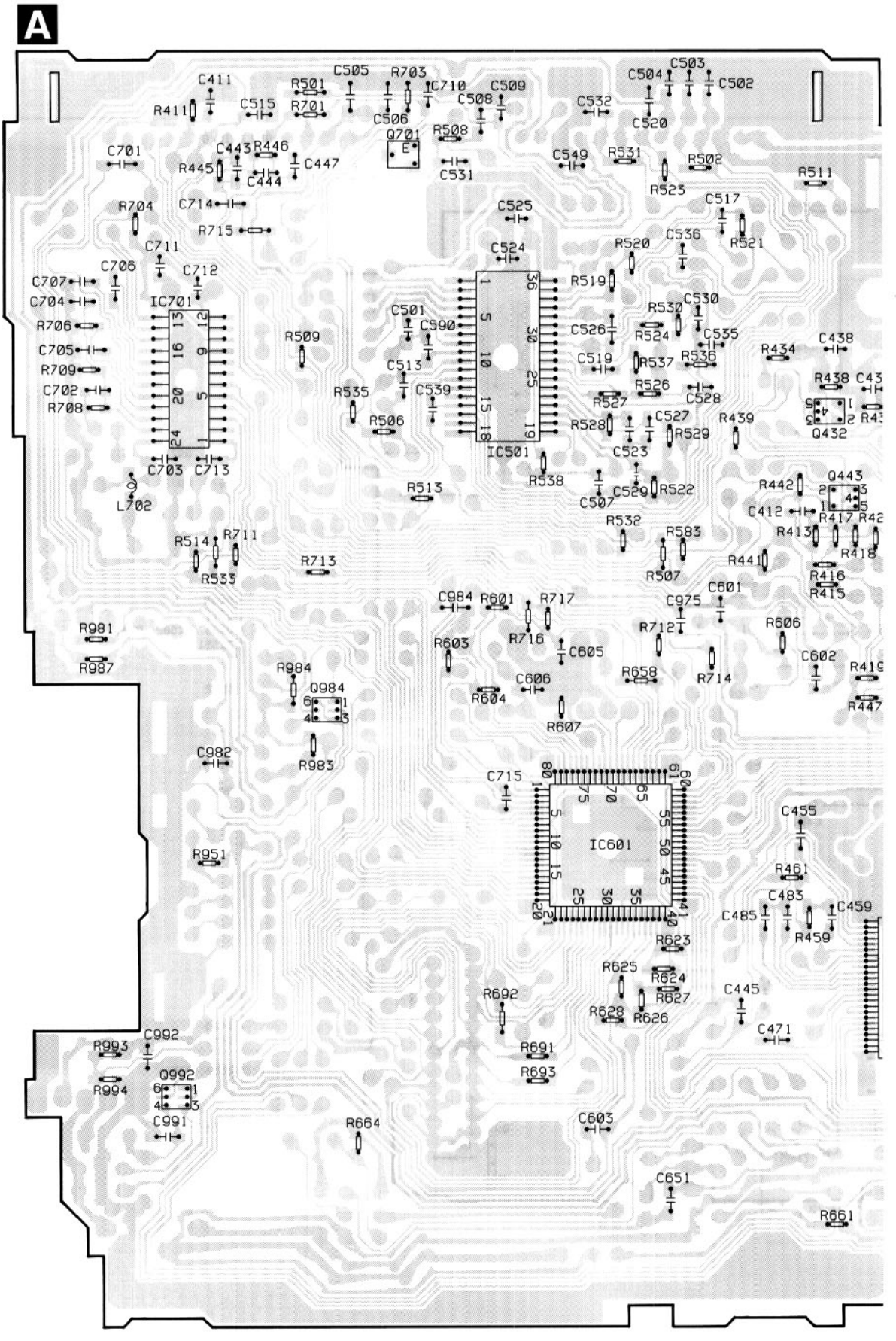


SIDE A

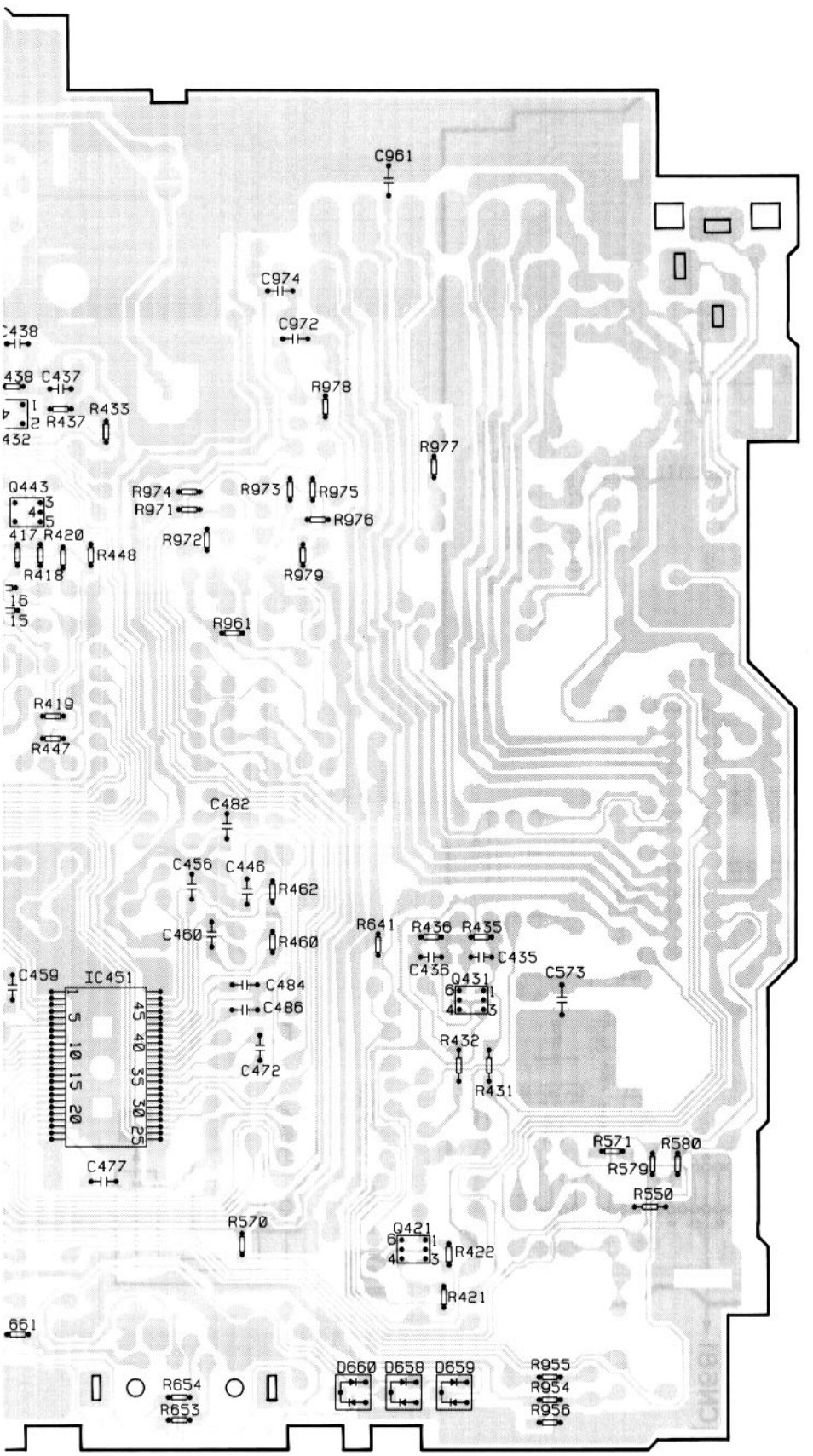


ADJ	IC. Q
VR701	Q501
	Q502
	Q703 Q973
	Q971 Q972
	Q445
	Q414
	Q961
	Q413
	Q981
	Q411
	Q983 IC602 Q641
	IC551
	Q962
	Q982
	Q951
	Q952
	Q991
	Q423
	Q651 Q441 Q551
	Q654 Q653
	Q953

Fig. 21


A
C411
R411
R501
C515
R701
C505
R703
C710
C506
C509
C508
Q701
E
R508
C531
C532
C504
C503
C502
C520
C549
R531
R502
R523
R511
C517
R521
C525
C524
R520
C536
R519
C530
R530
C526
R524
C535
C519
R537
R536
C438
R434
R438
C528
R527
R528
C527
R529
R439
Q432
C523
IC501
R538
C529
R522
C507
R513
R532
R583
R507
R441
Q443
R442
C412
R417
R413
R418
R416
R415
C601
C975
R606
R712
C602
R714
R658
C605
R603
R601
R717
R716
C984
C606
R604
R607
R984
Q984
R983
C982
R981
R987
R951
C715
IC601
C455
R461
C483
C485
R459
C459
R623
R625
R624
R627
R628
R626
C445
C471
R692
R691
R693
C603
R664
C651
R661
C992
R993
R994
Q992
C991
C701
C443
R446
R445
C444
C447
R704
C714
R715
C711
C706
C712
C707
C704
IC701
R706
C705
R709
C702
R708
C703
C713
L702
R514
R711
R533
R713
R509
C501
C590
C513
C539
R535
R506
C703
C713

SIDE B



IC.Q

Q701

IC701

IC501

Q432

Q443

Q984

IC601

Q431
IC451

Q992

Q421

Fig. 22

4.2 CONTROL UNIT, DETECTOR PCB

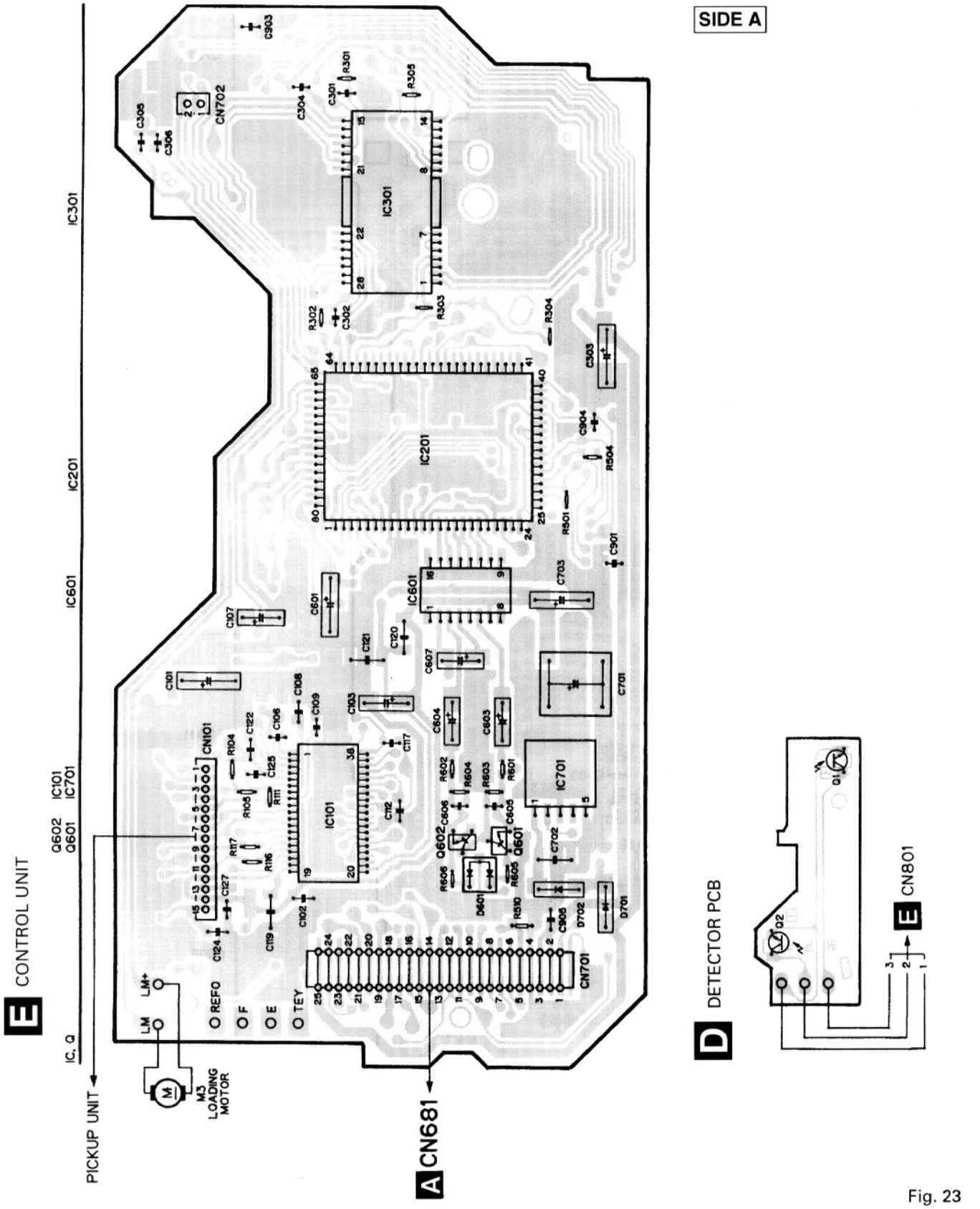


Fig. 23

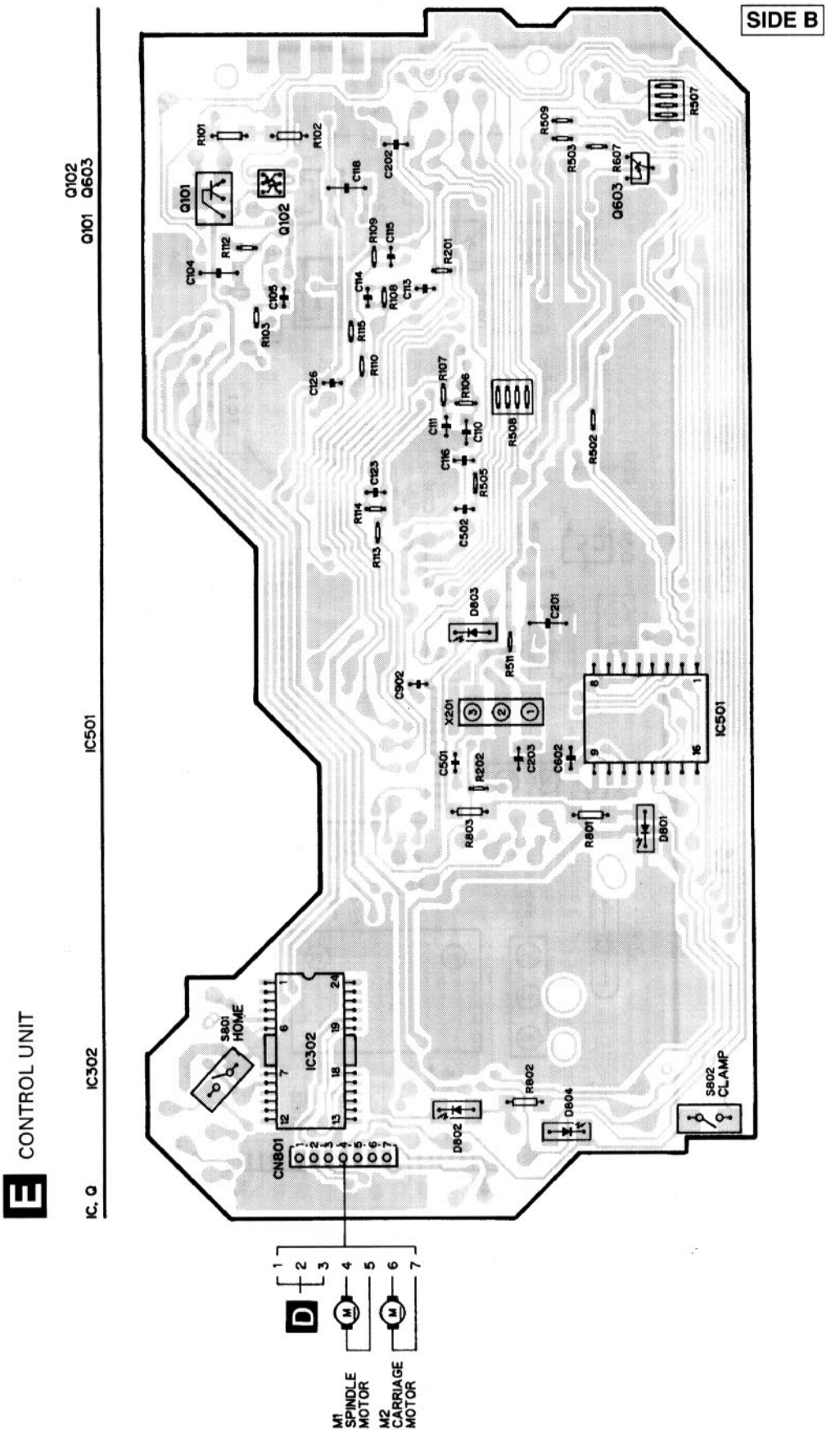

SIDE B
CONTROL UNIT
IC, Q
IC302
IC501
Q102
Q101 Q603
S801 HOME
S802 CLAMP
CN801
D
M1 SPINDLE MOTOR
M2 CARRIAGE MOTOR

Fig. 24

4.3 FM/AM TUNER UNIT

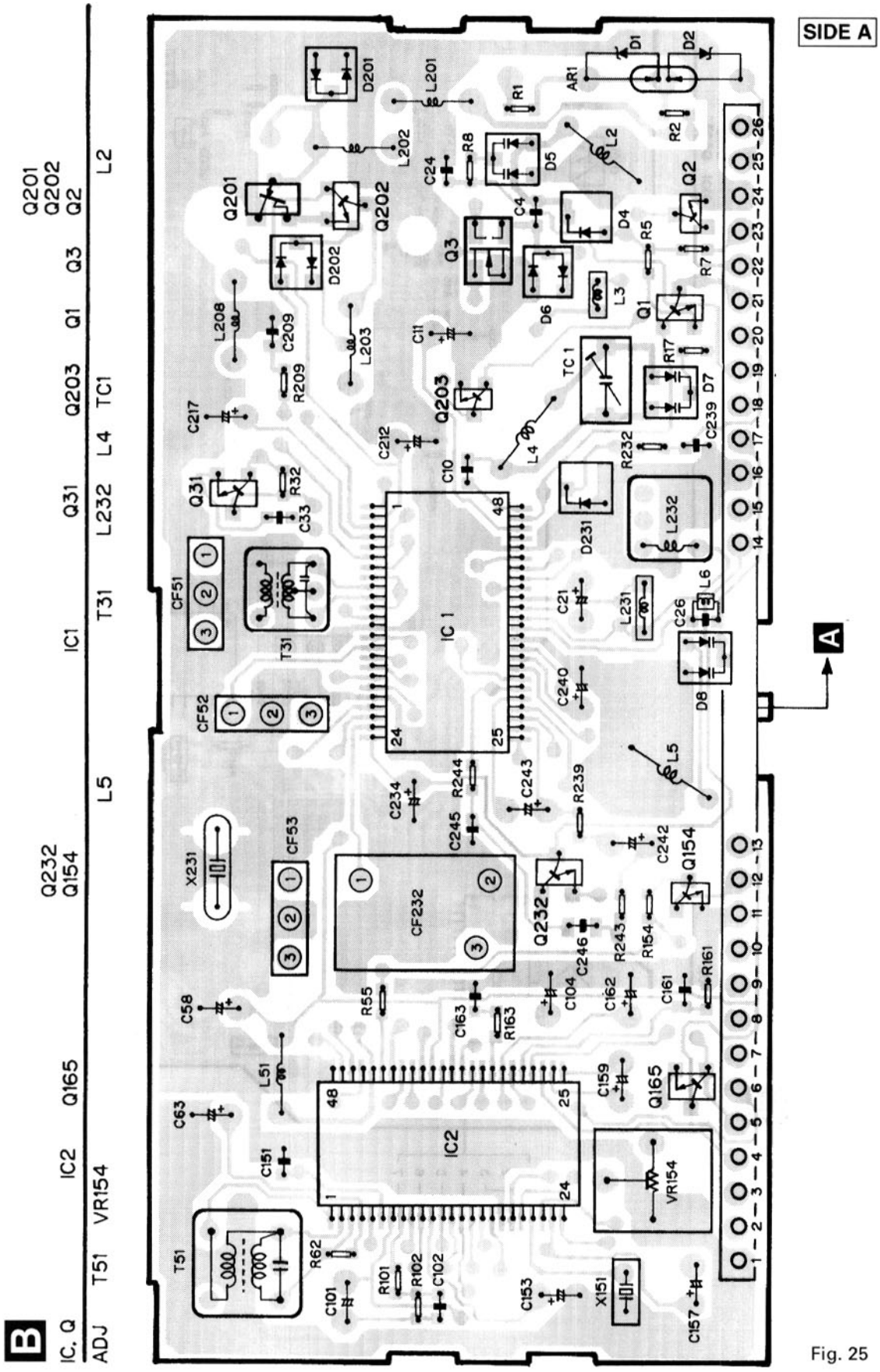


Fig. 25

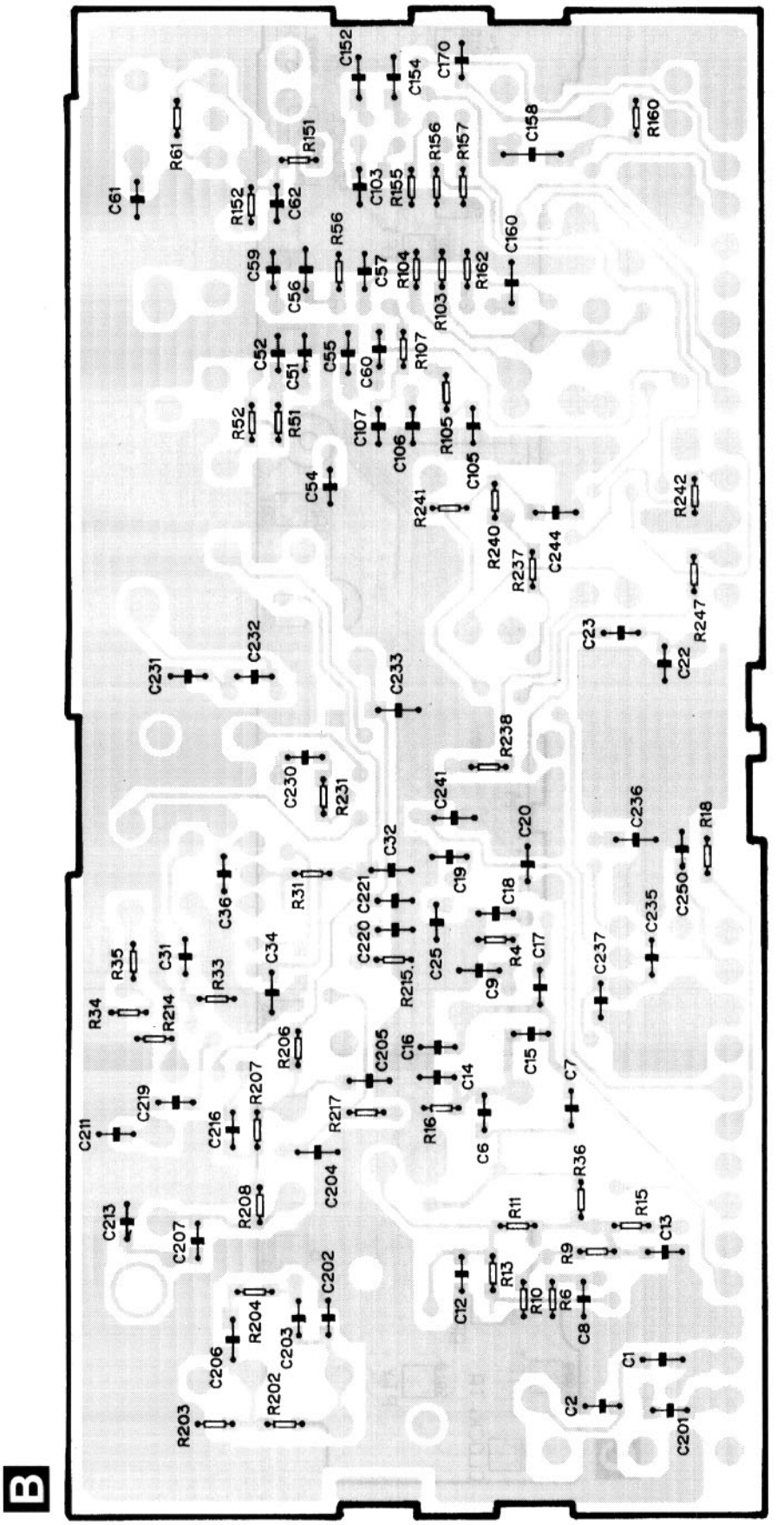

SIDE B
B
C61
R61
R152
C62
R151
C152
C154
C170
C103
R155
R156
R157
C158
R160
C59
C56
R56
C57
R104
R103
R162
C160
C52
C51
C55
C60
R107
R52
R51
C107
C106
R105
C105
C54
R241
R240
R237
C244
R242
C231
C232
C233
C230
R231
R238
C241
C32
C220
C221
C19
C18
C20
C25
R215
R4
C17
C9
C23
C22
R247
C236
R18
C235
C250
C237
R31
C36
C34
R35
R34
R214
C31
R33
R206
C205
C16
C14
C15
C7
R207
C219
C211
C216
R217
C204
R16
C6
R36
C213
C207
R208
R11
R15
C13
R9
R13
R10
R6
C12
C8
R204
C206
C202
C203
R202
R203
C1
C2
C201

Fig. 26

4.4 KEYBOARD UNIT

SIDE A

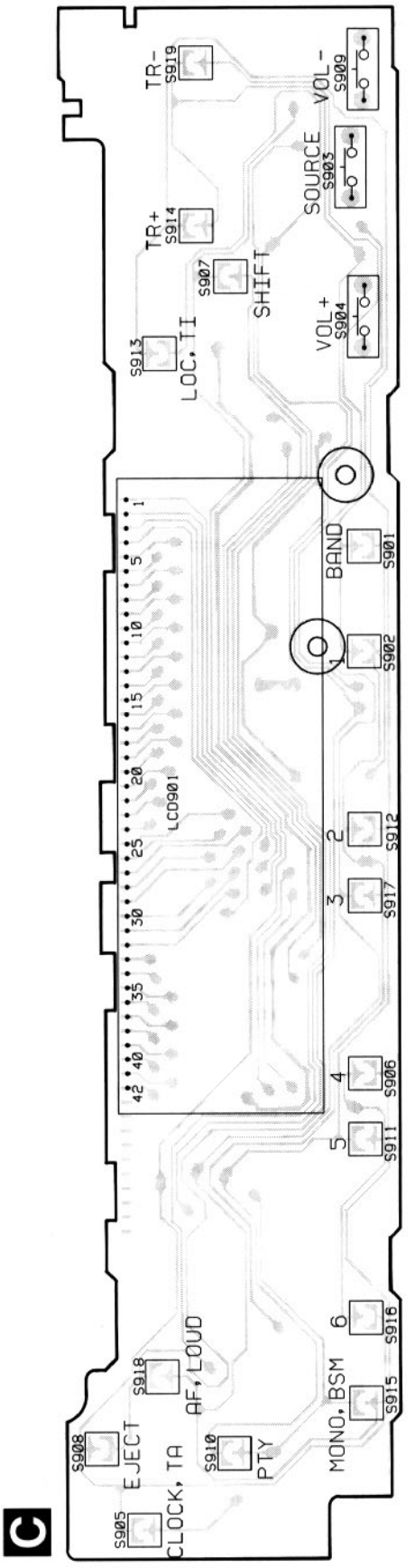


Fig. 27

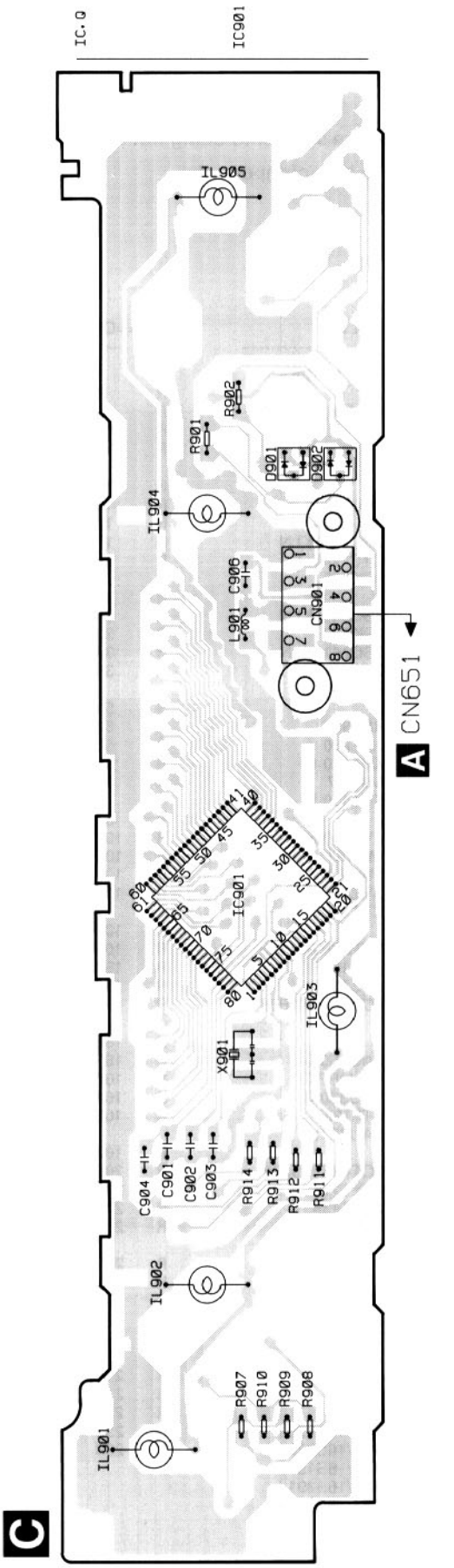

SIDE B
IC.0
IC901
IL905
R902
R901
D901
D902
IL904
C906
L901
CN901
A CN651
IC901
IL903
X901
C904
C901
C902
C903
R914
R913
R912
R911
IL902
R907
R910
R909
R908
IL901
C

Fig. 28

5. ELECTRICAL PARTS LIST

(1)PARTS LIST

NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/○S○○○J,RS1/○○S○○○J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

B Unit Number : CWE1417(Except for DEH-436/X1M/ES, 236/X1M/ES)
Unit Number : CWE1485(DEH-436/X1M/ES, 236/X1M/ES)
Unit Name : FM/AM Tuner Unit

MISCELLANEOUS

=====Circuit Symbol & No.		===Part Name	Part No.
IC	1	IC	PA4023B
IC	2	IC	PA4024A
Q	1	Transistor	2SC2412KLN
Q	2	Transistor	DTC124EU
Q	3	FET	3SK263
Q	31	Transistor	2SC2412KLN
Q	201	FET	2SK932
Q	202	Transistor	2SC2412KLN
Q	203	Transistor	DTC124EU
D	1	Diode	RD39JS
D	2	Diode	RD39JS
D	4	Diode	1SV250
D	5	Diode	KV1410-F1
D	6	Diode	MA157
D	7	Diode	KV1410-F1
D	8	Diode	KV1410-F1
D	201	Diode	MA157
D	202	Diode	MA157
D	231	Diode	SVC253
L	2	Coil	CTC1108
L	3	Inductor	LCTB2R2K2125
L	4	Coil	CTC1108
L	5	Coil	CTC1107
L	6	Inductor (DEH-436/X1M/ES,236/X1M/ES)	LCTBR15K1608
L	51	Ferri-Inductor	LAU150K
L	201	Ferri-Inductor	LAU4R7K
L	202	Ferri-Inductor	LAU330K
L	203	Inductor	CTF1287
L	208	Inductor	LAU121K
L	231	Inductor	LCTA3R3J3225
T	31	Coil	CTE1116
T	51	Coil	CTC1136
CF	51	Ceramic Filter	CTF1290
CF	52	Ceramic Filter	CTF1290
CF	53	Ceramic Filter	CTF1290
CF	232	Ceramic Filter	CTF1348
X	151	Resonator 920.5kHz	CSS1365
X	231	Crystal Resonator 10.26MHz	CSS1111
VR	154	Semi-fixed 150kΩ(B)	CCP1213

RESISTORS

=====Circuit Symbol & No.		===Part Name	Part No.
R	1		RS1/16S225J
R	2		RS1/16S225J
R	4		RS1/16S154J
R	5		RS1/16S391J
R	6		RS1/16S223J
R	7		RS1/16S123J
R	8		RS1/16S332J
R	9		RS1/16S473J
R	10		RS1/16S223J
R	11		RS1/16S124J
R	13		RS1/16S563J
R	15		RS1/16S271J
R	16		RS1/16S104J
R	17		RS1/16S332J
R	18		RS1/16S332J
R	31		RS1/16S470J
R	32		RS1/16S822J
R	33		RS1/16S822J
R	34		RS1/16S331J
R	35		RS1/16S331J
R	51		RS1/16S271J
R	52		RS1/16S560J
R	55		RS1/16S102J
R	56		RS1/16S823J
R	61		RS1/16S392J
R	62		RS1/16S273J
R	101		RS1/16S272J
R	102		RS1/16S682J
R	103		RS1/16S333J
R	104		RS1/16S334J
R	105		RS1/16S683J
R	107		RS1/16S222J
R	151		RS1/16S222J
R	152		RS1/16S393J
R	155		RS1/16S273J
R	156		RS1/16S243J
R	157		RS1/16S203J
R	160		RS1/16S222J
R	161		RS1/16S563J
R	162		RS1/16S105J
R	163		RS1/16S223J
R	202		RS1/16S223J
R	203		RS1/16S225J
R	204		RS1/16S103J
R	206		RS1/16S220J
R	207		RS1/16S101J
R	208		RS1/16S102J
R	209		RS1/16S471J
R	214		RS1/16S822J
R	215		RS1/16S822J
R	217		RS1/16S102J
R	231		RS1/16S272J
R	232		RS1/16S473J
R	237		RS1/16S103J
R	238		RS1/16S104J

Circuit Symbol & No.	Part Name	Part No.
R 239		RS1/16S104J
R 240		RS1/16S332J
R 241		RS1/16S202J
R 243		RS1/16S183J
R 244		RS1/16S392J
R 247		RS1/16S123J
CAPACITORS		
C 1		CCSQCH6R0D50
C 2		CCSRCK2R0C50
C 4		CCSRCH820J50
C 6		CCSRCH820J50
C 8		CKSRYB103K25
C 9		CKSQYB104K16
C 10		CCSRCKR50C50
C 11		CEJA1R0M50
C 12		CKSRYB222K50
C 13		CKSRYB222K50
C 14		CCSRCH220J50
C 15		CCSRCH6R0D50
C 16		CCSRCH8R0D50
C 17		CKSRYB222K50
C 18		CKSRYB103K25
C 19		CKSRYB222K50
C 20		CKSRYB222K50
C 21		CEJA100M16
C 22		CCSRTH9R0D50
C 23		CCSRTH120J50
C 24		CCSRCH471J50
C 25		CKSRYB103K25
C 26		CCSRCH101J50
	(Except for DEH-436/X1M/ES,236/X1M/ES)	
C 31		CKSRYB103K25
C 32		CKSQYB472K50
C 33		CCSRCH5R0C50
C 34		CKSQYB104K16
C 36		CCSRRH201J50
C 51		CKSRYB223K25
C 52		CKSRYB103K25
C 54		CCSRCH470J50
C 55		CKSQYB223K25
C 56		CKSQYB104K16
C 57		CKSRYB472K50
C 58		CEJA330M10
C 59		CKSRYB103K25
C 60		CKSRYB102K50
C 61		CCSRCH270J50
C 62		CKSRYB103K25
C 63		CEJAR22M50
C 101		CEJANP100M10
C 102		CKSRYB182K50
C 103		CKSRYB682K25
C 104		CEJA2R2M50
C 105		CKSRYB103K25
C 106		CCSRCH151J50
C 107		CKSRYB103K25
C 151		CKSRYB472K50
C 152		CKSQYB104K16
C 153		CEJA3R3M50
C 154		CKSQYB104K16
C 157		CEJA3R3M50
C 158		CKSYB474K16
C 159		CEJA220M6R3
C 160		CKSQYB104K16
C 161		CKSQYB104K16
C 162		CEJA3R3M50
C 163		CKSRYB102K50
C 170		CCSRCH100D50
C 201		CCSRCH471J50
C 202		CCSRCH100D50
C 203		CKSRYB332K50
C 204		CKSQYB473K16
C 205		CKSQYB473K16
C 206		CKSQYB104K16
C 207		CCSRCH560J50
C 209		CKSQYB104K16
C 211		CCSRCH101J50
C 212		CEJA470M6R3
C 213		CKSRYB103K25
C 216		CCSRCH101J50
C 217		CEJA1R5M50
C 219		CCSRCH471J50
C 220		CKSRYB103K25
C 230		CKSRYB103K25
C 231		CCSRCH330J50
C 232		CCSRCH150J50
C 233		CKSQYB104K16
C 234		CEJA330M10
C 235		CKSRYB332K50
C 236		CKSQYB473K16
C 237		CCSRCH120J50
C 239		CKSRYB472K50
C 240		CEJAR47M50
C 241		CKSQYB104K16
C 242		CEJAR47M50
C 243		CEJAR33M50
C 244		CKSQYB473K16
C 245		CKSRYB333K16
C 246		CKSQYB473K16
C 250		CCSRCH471J50

E Unit Number : CWX1889
Unit Name : Control Unit

MISCELLANEOUS

IC	101	IC	UPC2572GS
IC	201	IC	UPD63702GF
IC	301	IC	XLA6997FP
IC	302	IC	XLA6285FP
IC	601	IC	TA2063F
IC	701	IC	PQ05TZ51
Q	101	Transistor	2SD1664
Q	102	Transistor	UMD2N
Q	601	Transistor	2SD1781K
Q	602	Transistor	2SD1781K
Q	603	Transistor	2SB709A
D	601	Diode	MA151WA
D	701	Diode	1SR154-400
D	702	Diode	1SR154-400
D	801		CL200IRX
D	802		CL200IRX
X	201	Ceramic Resonator 16.93MHz	CSS1363
S	801	Switch(Home)	CSN1028
S	802	Switch(Clamp)	CSN1028

Circuit Symbol & No.	Part Name	Part No.
RESISTORS		
R 101		RS1/8S100J
R 102		RS1/8S120J
R 103		RS1/16S102J
R 104		RS1/16S822J
R 105		RS1/16S682J
R 106		RS1/16S183J
R 107		RS1/16S822J
R 108		RS1/16S333J
R 109		RS1/16S683J
R 110		RS1/16S134J
R 111		RS1/16S273J
R 112		RS1/16S222J
R 113		RS1/16S103J
R 114		RS1/16S103J
R 115		RS1/16S102J
R 116		RS1/16S163J
R 117		RS1/16S163J
R 201		RS1/16S104J
R 202		RS1/16S473J
R 304		RS1/16S0R0J
R 501		RS1/16S0R0J
R 505		RS1/16S102J
R 507		RA4C102J
R 508		RA4C681J
R 510		RS1/10S0R0J
R 601		RS1/16S102J
R 602		RS1/16S102J
R 603		RS1/16S223J
R 604		RS1/16S223J
R 605		RS1/16S162J
R 606		RS1/16S162J
R 607		RS1/16S103J
R 801		RS1/8S751J
R 802		RS1/8S751J
CAPACITORS		
C 101		CEV101M6R3
C 102		CKSQYB104K16
C 103		CEV470M6R3
C 104		CKSYB334K16
C 105		CCSRCH330J50
C 106		CKSRYB103K25
C 107		CEV4R7M35
C 108		CKSQYB273K50
C 109		CCSRCH101J50
C 110		CKSQYB104K16
C 111		CKSRYB332K50
C 112		CKSQYB473K16
C 113		CKSRYB103K25
C 114		CKSRYB391K50
C 115		CCSRCH121J50
C 116		CKSRYB682K25
C 117		CKSRYB333K16
C 118		CKSYB334K16
C 119		CKSYB334K16
C 120		CKSYB334K16
C 121		CKSYB334K16
C 122		CKSQYB104K16
C 123		CKSRYB472K50
C 124		CKSQYB104K16
C 125		CCSRCH6R0D50
C 126		CKSRYB153K25
C 127		CCSRCH102J25
C 201		CKSYB334K16
C 202		CKSQYB104K16
C 203		CKSQYB104K16

Circuit Symbol & No.	Part Name	Part No.
C 303		CEV470M16
C 304		CKSRYB103K25
C 305		CKSRYB103K25
C 306		CKSRYB103K25
C 502		CKSRYB471K50
C 601		CEV101M6R3
C 602		CKSQYB104K16
C 603		CEV4R7M35
C 604		CEV4R7M35
C 605		CKSRYB152K50
C 606		CKSRYB152K50
C 607		CEV220M6R3
C 701	22 μF/6.3V	CCH1233
C 702		CKSYB334K16
C 703		CEV101M6R3
C 901		CCSRCH471J50
C 902		CCSRCH271J50
C 903		CCSRCH471J50
C 904		CCSRCH101J50

A

Unit Number : CWM4964(DEH-48/X1M/UC)
Unit Number : CWM4965(DEH-435/X1M/UC)
Unit Number : CWM4966(DEH-43/X1M/UC)
Unit Number : CWM4967(DEH-436/X1M/ES)
Unit Number : CWM4968(DEH-235/X1M/UC)
Unit Number : CWM4969(DEH-236/X1M/ES)
Unit Name : Tuner Amp Unit

MISCELLANEOUS

IC	451	IC	SN761027DL
IC	501	IC	PM2004B
IC	551	IC	TDA7384A
IC	601	IC	PDR027B
IC	602	IC	S-80734AN
Q	421	See Contrast table(2)	
Q	423	See Contrast table(2)	
Q	431	Transistor	IMH3A
Q	432	See Contrast table(2)	
Q	441	Transistor	DTA124ES
Q	501	Transistor	2SC2458
Q	502	Transistor	DTC114ES
Q	551	Transistor	DTC144ES
Q	641	See Contrast table(2)	
Q	651	Transistor	2SA1048
Q	653	Transistor	2SB1236
Q	654	Transistor	DTC124ES
Q	951	Transistor	2SB1243
Q	952	Transistor	DTC124ES
Q	961	Transistor	2SB1243
Q	962	Transistor	DTC114ES
Q	971	Transistor	2SC2458
Q	972	Transistor	2SC2458
Q	973	Transistor	2SD1859
Q	981	Transistor	2SD2396
Q	982	Transistor	2SA1674
Q	983	Transistor	2SA1674
Q	984	Transistor	IMH1A
Q	991	Transistor	2SD2396
Q	992	Transistor	IMD2A
D	503	Diode	1SS133
D	504	Diode	1SS133
D	601	See Contrast table(2)	
D	657	Diode	HZS6L(B2)
D	658	See Contrast table(2)	
D	659	See Contrast table(2)	
D	660	See Contrast table(2)	
D	951	Diode	1SR139-200
D	952	Diode	1SR139-200
D	961	Diode	1SR139-200

=====Circuit Symbol & No.===Part Name			Part No.
D	962	Diode	1SR139-200
D	971	Diode	HZS6L(C3)
D	972	Diode	HZS7L(C2)
D	973	Diode	1SR139-200
D	974	Diode	HZS6L(B1)
D	981	Diode	HZS9L(B3)
D	992	Diode	HZS9L(B1)
L	501	Ferri-Inductor	LAU220K
L	502	Ferri-Inductor	LAU2R2K
L	503	Ferri-Inductor	LAU2R2K
L	601	Ferri-Inductor	LAU2R2K
L	602	Ferri-Inductor	LAU101K
L	651	Ferri-Inductor	LAU101K
TH	601	Thermistor	CCX1031
X	501	Crystal Resonator 7.200MHz	CSS1379
X	601	Ceramic Resonator 4.194MHz	CSS1047
BZ	601	See Contrast table(2)	
		FM/AM Tuner Unit	See Contrast table(2)
RESISTORS			
R	421	See Contrast table(2)	
R	422		RS1/10S104J
R	431		RS1/8S471J
R	432		RS1/8S471J
R	433		RS1/10S102J
R	434		RS1/10S102J
R	435		RS1/10S223J
R	436		RS1/10S223J
R	437		RS1/10S223J
R	438		RS1/10S223J
R	441		RS1/10S0R0J
R	442		RS1/10S0R0J
R	443		RD1/4PU222J
R	444		RD1/4PU222J
R	445		RS1/10S162J
R	446		RS1/10S162J
R	459		RS1/10S272J
R	460		RS1/10S272J
R	461		RS1/10S151J
R	462		RS1/10S151J
R	475		RD1/4PU471J
R	476		RD1/4PU471J
R	501		RS1/8S102J
R	502		RS1/10S222J
R	503		RD1/4PU472J
R	504		RD1/4PU223J
R	506	See Contrast table(2)	
R	507		RS1/8S473J
R	508		RS1/10S102J
R	509		RS1/10S472J
R	511		RS1/10S222J
R	513		RS1/10S472J
R	514		RS1/10S473J
R	515		RD1/4PU681J
R	516		RD1/4PU681J
R	517		RD1/4PU101J
R	518		RD1/4PU681J
R	519		RS1/10S392J
R	520		RS1/10S392J
R	521		RS1/10S152J
R	522		RS1/10S682J
R	523		RS1/10S103J
R	524		RS1/10S561J
R	525		RD1/4PU272J
R	526		RS1/10S472J
R	527		RS1/10S682J
R	528		RS1/10S472J
R	529		RS1/10S681J
R	530		RS1/10S222J
R	531		RS1/10S103J

=====Circuit Symbol & No.===Part Name			Part No.
R	532		RS1/10S224J
R	533		RS1/8S0R0J
R	534		RD1/4PU102J
R	535	See Contrast table(2)	
R	536		RS1/8S102J
R	537		RS1/10S0R0J
R	550		RS1/8S0R0J
R	570		RS1/10S103J
R	571		RS1/10S103J
R	579		RS1/10S331J
R	580		RS1/10S103J
R	581		RD1/4PU102J
R	582		RD1/4PU102J
R	583		RS1/10S562J
R	584		RD1/4PU102J
R	601		RN1/10SE2202D
R	602	See Contrast table(2)	
R	603	See Contrast table(2)	
R	604		RS1/10S393J
R	605		RD1/4PU102J
R	606		RS1/10S124J
R	607		RS1/10S473J
R	621		RD1/4PU473J
R	624		RS1/10S0R0J
R	626	See Contrast table(2)	
R	627	See Contrast table(2)	
R	628		RS1/10S473J
R	638		RD1/4PU473J
R	639		RD1/4PU473J
R	641	See Contrast table(2)	
R	642	See Contrast table(2)	
R	651		RD1/4PU472J
R	652		RD1/4PU472J
R	653		RS1/10S222J
R	654		RS1/10S222J
R	655		RD1/4PU222J
R	656		RD1/4PU472J
R	657		RD1/4PU222J
R	658		RS1/8S222J
R	659		RD1/4PU473J
R	661		RS1/10S1R0J
R	664		RS1/10S472J
R	665		RD1/4PU102J
R	668		RD1/4PU222J
R	681		RD1/4PU222J
R	682		RD1/4PU222J
R	683		RD1/4PU222J
R	688		RD1/4PU681J
R	691		RS1/10S102J
R	692		RS1/8S102J
R	693		RS1/10S102J
R	951		RS1/10S472J
R	952		RD1/4PU331J
R	953		RD1/4PU331J
R	961		RS1/10S472J
R	962		RD1/2PM561J
R	971		RS1/10S473J
R	972		RS1/10S103J
R	973		RS1/10S473J
R	974		RS1/10S473J
R	975		RS1/10S103J
R	976		RS1/10S473J
R	977		RS1/10S101J
R	978		RS1/10S472J
R	979		RS1/10S472J
R	981		RS1/10S1R0J
R	982		RD1/4PU471J
R	983		RS1/10S472J
R	984		RS1/8S472J
R	985		RD1/4PU102J

=====Circuit Symbol & No.===Part Name			Part No.
R	986		RD1/4PU102J
R	987		RS1/10S221J
R	991		RD1/4PU221J
R	992		RD1/4PU221J
R	993		RS1/10S472J
R	994		RS1/10S122J
CAPACITORS			
C	421		CEJA3R3M50
C	422		CEJA3R3M50
C	431		CEJA100M16
C	432		CEJA100M16
C	433		CEJA100M16
C	434		CEJA100M16
C	435		CCSQCH220J50
C	436		CCSQCH220J50
C	437		CCSQCH220J50
C	438		CCSQCH220J50
C	443		CKSQYB473K50
C	444		CKSQYB473K50
C	445		CKSQYB102K50
C	446		CKSQYB102K50
C	447		CKSQYB102K50
C	451		CEJA2R2M50
C	452		CEJA2R2M50
C	453		CEJA4R7M35
C	454		CEJA4R7M35
C	455		CKSYB104K50
C	456		CKSQYB104K50
C	457		CEJANP100M16
C	458		CEJANP100M16
C	459		CKSQYB822K50
C	460		CKSQYB822K50
C	461		CEJA1R0M50
C	462		CEJA1R0M50
C	469		CEJA2R2M50
C	470		CEJA2R2M50
C	471		CKSQYB333K50
C	472		CKSQYB333K50
C	473		CEJA220M6R3
C	474		CEJA2R2M50
C	477		CKSQYB104K50
C	481		CEJA470M10
C	482		CKSQYB104K50
C	483		CKSQYB183K50
C	484		CKSQYB183K50
C	485		CKSQYB102K50
C	486		CKSQYB102K50
C	501		CKSQYB103K50
C	502		CKSQYB223K50
C	503		CKSQYB223K50
C	504		CKSQYB473K50
C	505		CCSCH101J50
C	506		CKSYB103K50
C	507		CKSQYB102K50
C	508		CKSQYB103K50
C	509		CKSQYB223K50
C	510		CEJA220M10
C	512		CEJA220M10
C	513		CKSQYB102K50
C	515		CKSQYB223K50
C	516	4.7µF/16V	CCH1250
C	517		CKSQYB103K50
C	518	4.7µF/16V	CCH1250
C	519		CKSQYB103K50
C	520		CKLSR473K16
C	522		CEJA220M10
C	523		CKSQYB104K50

=====Circuit Symbol & No.===Part Name			Part No.
C	524		CCSQCH150J50
C	525		CCSQCH150J50
C	526		CKSYB332K50
C	527		CKSQYB103K50
C	529		CKSQYB103K50
C	530		CKSQYB103K50
C	531		CCSQCH101J50
C	532		CKSQYB103K50
C	535		CKSQYB223K50
C	536		CKSQYB103K50
C	539		CKSQYB473K50
C	551		CEJAR22M50
C	552		CEJAR22M50
C	553		CEJAR22M50
C	554		CEJAR22M50
C	556	3300µF/16V	CCH1150
C	570		CEJA100M16
C	571		CEJA330M10
C	572		CEJA1R0M50
C	573		CKSYB104K50
C	574		CEJA1R0M50
C	590		CKSQYB103K50
C	591		CEJA220M10
C	604		CEJA4R7M35
C	605		CKSQYB473K50
C	606		CKSQYB473K50
C	607		CEJA2R2M50
C	651		CKSQYB473K50
C	652		CEJA4R7M35
C	961		CKSYB473K50
C	971	470µF/16V	CCH-114-
C	972		CKSQYB473K50
C	973		CEJA101M10
C	974		CKSQYB473K50
C	981		CEAS331M10
C	982		CKSQYB103K50
C	983		CEJA101M16
C	984		CKSYB473K50
C	991		CKSQYB473K50
C	992		CKSQYB102K50
C	993		CEAL101M10

C Unit Number : CWM4973(Except for DEH-235/X1M/UC, 236/X1M/ES)
Unit Number : CWM5203(DEH-235/X1M/UC,236/X1M/ES)
Unit Name : Keyboard Unit

MISCELLANEOUS

IC	901	IC	PD6122A
D	901	Diode (Except for DEH-235/X1M/UC,236/X1M/ES)	DA204K
D	902	Diode (Except for DEH-235/X1M/UC,236/X1M/ES)	DA204K
L	901	Inductor	LCTB4R7K3216
X	901	Ceramic Resonator 4.97MHz	CSS1312
S	903	Switch	CSG-253
S	904	Switch	CSG-253
S	909	Switch	CSG-253
IL	901	Lamp 14V 40mA	CEL1481
IL	902	Lamp 14V 40mA	CEL1481
IL	903	Lamp 14V 40mA	CEL1481
IL	904	Lamp 14V 40mA	CEL1481
IL	905	Lamp 14V 40mA	CEL1481
LCD	901	LCD	CAW1330

=====Circuit Symbol & No.===Part Name	Part No.
RESISTORS	
R 901	RS1/8S222J
R 902	RS1/8S222J
R 908	RS1/10S0R0J
R 909	RS1/10S0R0J
R 911	RS1/10S471J
R 912	RS1/10S471J
R 913	RS1/10S471J
R 914	RS1/10S471J
CAPACITORS	
C 901	CKSQYB103K50
C 902	CKSQYB103K50
C 903	CKSQYB103K50
C 904	CKSQYB103K50
C 906	CKSQYB473K50

=====Circuit Symbol & No.===Part Name	Part No.
D Unit Number : Unit Name : Detector PCB	
Q 1 Photo-transistor	CPT-230S-X
Q 2 Photo-transistor	CPT-230S-X
Miscellaneous Parts List	
Pickup Unit(SERVICE)	CXX1230
M 1 Motor Unit(Spindle)	CXA9407
M 2 CRG Motor Unit(Carriage)	CXA9392
M 3 Load Motor Unit(Loading)	CXA9391

(2) CONTRAST TABLE

DEH-48/X1M/UC, DEH-435/X1M/UC, DEH-43/X1M/UC, DEH-436/X1M/ES, DEH-235/X1M/UC and DEH-236/X1M/ES have the same construction except for the following:

	Part No.					
Circuit Symbol & No.	DEH-48/X1M/UC	DEH-435/X1M/UC	DEH-43/X1M/UC	DEH-436/X1M/ES	DEH-235/X1M/UC	DEH-236/X1M/ES
Q421	IMH3A	IMH3A	Not used	Not used	Not used	Not used
Q423	DTA124ES	DTA124ES	Not used	Not used	Not used	Not used
Q432	FMG3A	Not used	Not used	Not used	Not used	Not used
Q641	DTC114ES	Not used	Not used	Not used	Not used	Not used
D657	HZS6L(B2)	HZS6L(B2)	HZS6L(B2)	HZS6L(B2)	Not used	Not used
D658,659,660	MA153	MA153	MA153	MA153	Not used	Not used
FM/AM Tuner Unit	CWE1417	CWE1417	CWE1417	CWE1485	CWE1417	CWE1485
BZ601	CPV1011	Not used	Not used	Not used	Not used	Not used
R421,422	RS1/10S104J	RS1/10S104J	Not used	Not used	Not used	Not used
R506	RS1/10S0R0J	RS1/10S0R0J	RS1/10S0R0J	Not used	RS1/10S0R0J	Not used
R535	Not used	Not used	Not used	RS1/10S182J	Not used	RS1/10S182J
R602	RD1/4PU104J	RD1/4PU473J	RD1/4PU333J	RD1/4PU333J	RD1/4PU473J	RD1/4PU333J
R603	RS1/10S333J	RS1/10S333J	RS1/10S473J	RS1/10S104J	RS1/10S333J	RS1/10S104J
R626	RS1/10S0R0J	RS1/10S0R0J	RS1/10S0R0J	RS1/10S0R0J	Not used	Not used
R627	Not used	Not used	Not used	Not used	RS1/10S473J	RS1/10S473J
R641	RS1/10S202J	Not used	Not used	Not used	Not used	Not used
R642	RD1/4PU102J	Not used	Not used	Not used	Not used	Not used
C421,422	CEJA3R3M50	CEJA3R3M50	Not used	Not used	Not used	Not used
C433,434	CEJA100M16	Not used	Not used	Not used	Not used	Not used
C437,438	CCSQCH220J50	Not used	Not used	Not used	Not used	Not used
C651	CKSQYB473K50	CKSQYB473K50	CKSQYB473K50	CKSQYB473K50	Not used	Not used

6. ADJUSTMENT

6.1 TUNER ADJUSTMENT

● Connection Diagram

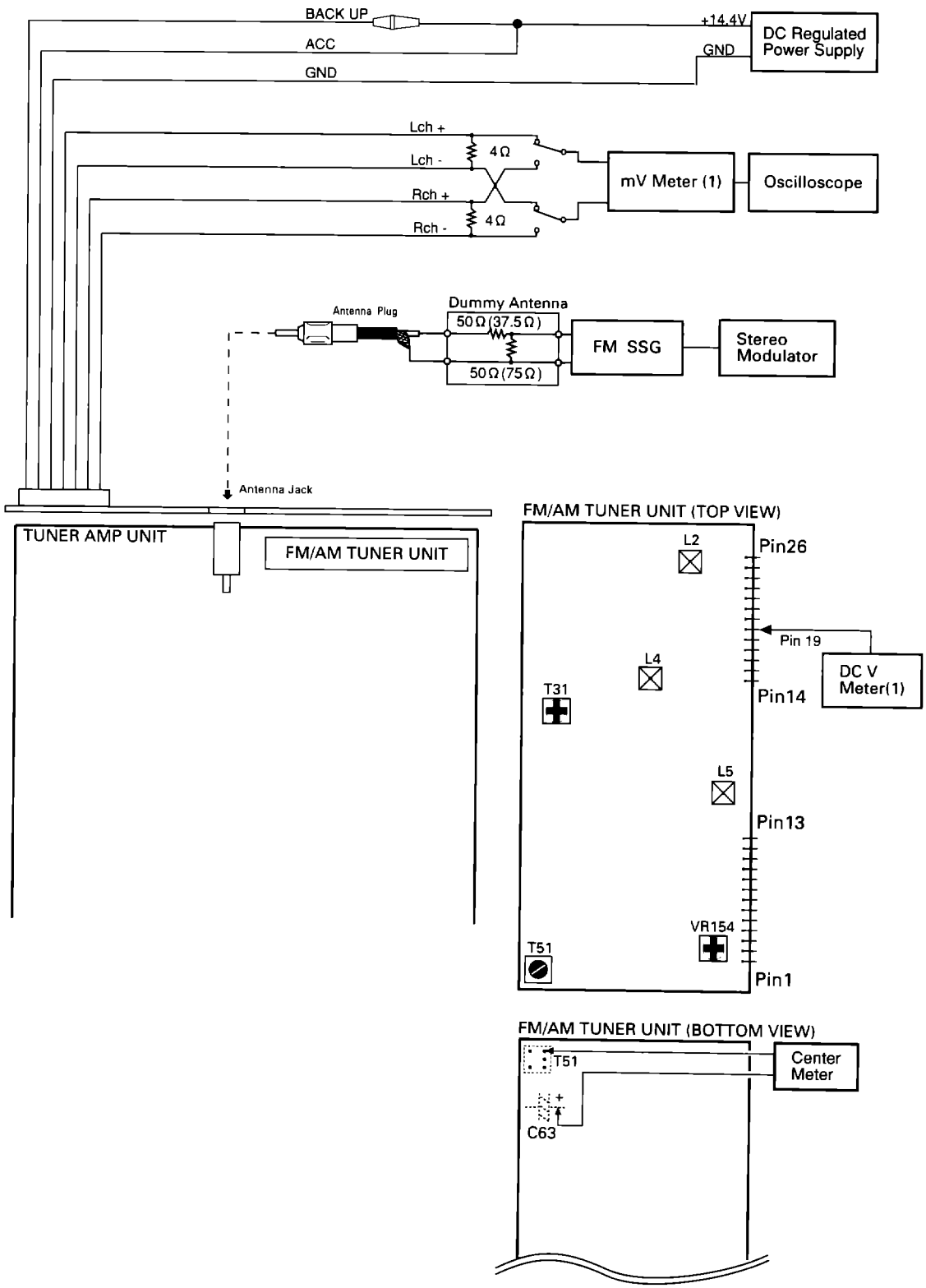


Fig. 29

FM ADJUSTMENT(DEH-48/X1M/UC, DEH-435/X1M/UC, DEH-43/X1M/UC, DEH-235/X1M/UC)

Modulation M:MONO MOD., 400Hz 30%(22.5kHz Dev.)
S:STEREO MOD., 1kHz, L or R=30%(20.25kHz+7.5kHz Dev.)

NOTE:Before proceeding to further adjustments after switching power ON, let the tuner run for ten minutes to allow the circuits to stabilize.

	No.	FM SSG		Displayed	Adjustment	Adjustment Method
		Frequency(MHz)	Level(dBf)	Frequency(MHz)	Point	(Switch Position)
TUN Volt	1	•••••	•••••	107.9	L5	DC V Meter(1) : 6V
IF	1	98.1 M	60	98.1	T51	Center Meter : 0
ANT Coil	1	98.1 M	5	98.1	L2	mV Meter(1) : Maximum
RF Coil	1	98.1 M	5	98.1	L4	mV Meter(1) : Maximum
IFT	1	98.1 M	5	98.1	T31	mV Meter(1) : Maximum (STEREO MODE)
ARC	1	98.1 S	39	98.1	VR154	mV Meter(1) : Separation 5dB (STEREO MODE)

FM ADJUSTMENT(DEH-436/X1M/ES, DEH-236/X1M/ES)

	No.	FM SSG		Displayed	Adjustment	Adjustment Method
		Frequency(MHz)	Level(dBf)	Frequency(MHz)	Point	(Switch Position)
TUN Volt	1	•••••	•••••	108.0	L5	DC V Meter(1) : 6V
IF	1	98.1 M	60	98.1	T51	Center Meter : 0
ANT Coil	1	98.1 M	5	98.1	L2	mV Meter(1) : Maximum
RF Coil	1	98.1 M	5	98.1	L4	mV Meter(1) : Maximum
IFT	1	98.1 M	5	98.1	T31	mV Meter(1) : Maximum (STEREO MODE)
ARC	1	98.1 S	39	98.1	VR154	mV Meter(1) : Separation 5dB (STEREO MODE)

6.2 CD ADJUSTMENT

1)Precautions

· This unit uses a single power supply (+5V) for the regulator. The signal reference potential, therefore, is connected to REFO(approx. 2.5V) instead of GND.
If REFO and GND are connected to each other by mistake during adjustments, not only will it be impossible to measure the potential correctly, but the servo will malfunction and a severe shock will be applied to the pick-up. To avoid this, take special note of the following.
Do not connect the negative probe of the measuring equipment to REFO and GND together. It is especially important not to connect the channel 1 negative probe of the oscilloscope to REFO with the channel 2 negative probe connected to GND.
Since the frame of the measuring instrument is usually at the same potential as the negative probe, change the frame of the measuring instrument to floating status.
If by accident REFO comes in contact with GND, immediately switch the regulator or power OFF.

· Always make sure the regulator is OFF when connecting and disconnecting the various filters and wiring required for measurements.

· Before proceeding to further adjustments and measurements after switching regulator ON, let the player run for about one minute to allow the circuits to stabilize.

· Since the protective systems in the unit's software are rendered inoperative in test mode, be very careful to avoid mechanical and /or electrical shocks to the system when making adjustment.

· Test mode starting procedure
Switch ACC, back-up ON while pressing the **4** and **6** keys together.

· Test mode cancellation
Switch ACC, back-up OFF.

· Disc detection during loading and eject operations is performed by means of a photo transistor in this unit.Consequently, if the inside of the unit is exposed to a strong light source when the outer casing is removed for repairs or adjustment, the following malfunctions may occur.
*During PLAY, even if the eject button is pressed,the disc will not be ejected and the unit will remain in the PLAY mode.
*The unit will not load a disc.
When the unit malfunctions this way, either re-position the light source, move the unit or cover the photo transistor.

· When loading and unloading discs during adjustment procedures, always wait for the disc to be properly clamped or ejected before pressing another key. Otherwise, there is a risk of the actuator being destroyed.

· Turn power off when pressing the button TR+ or the button TR- key for focus search in the test mode. (Or else lens may stick and the actuator may be damaged.)

· SINGLE/4TRK/10TRK/32TRK will continue to operate even after the key is released.Tracking is closed the moment C-MOVE is released.

· JUMP MODE resets to SINGLE as soon as power is switched OFF.

6.3 CHECKING THE GRATING

● Checking the Grating After Changing the Pickup Unit

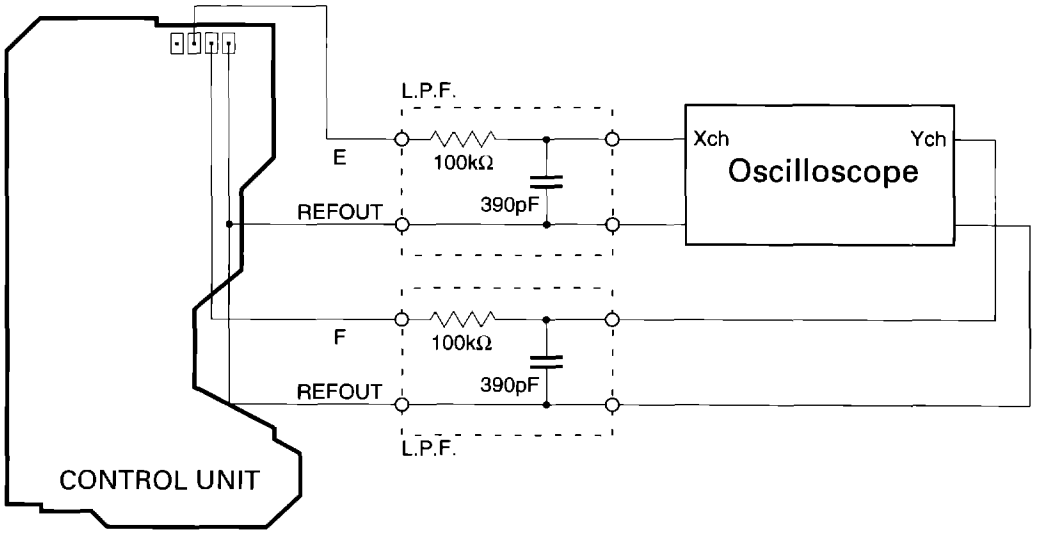
·**Note :**
Unlike previous CD mechanism modules the grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

·**Purpose :**
To check that the grating is within an acceptable range.

·**Symptoms of Mal-adjustment :**
If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or track searching taking a long time, may appear.

·**Method :**

·Measuring Equipment	·Oscilloscope, Two L.P.F.
·Measuring Points	·E, F, REFOUT
·Disc	·ABEX TCD-784
·Mode	·TEST MODE



·**Checking Procedure**

1. In test mode, load the disc and switch the 5V regulator on.
2. Using the **TR+** and **TR-** buttons, move the PU unit to the innermost track.
3. Press key **3** to close focus, the display should read "91". Press key **2** to implement the tracking balance adjustment the display should now read "81". Press key **3** 4 times. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75° . Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75° try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75° then the mechanism should be judged to be at fault.

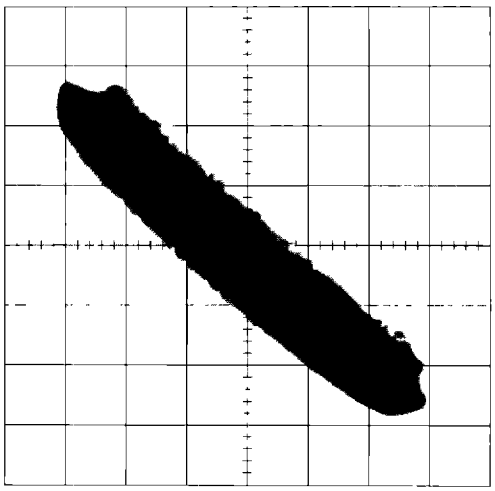
·**Note**
Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

·**Hint**
Reloading the disc changes the clamp position and may decrease the "wobble".

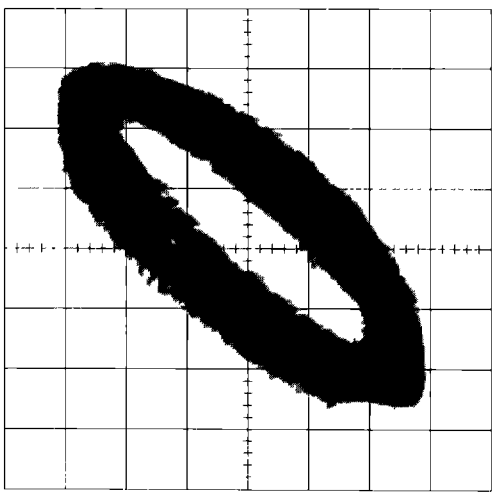
Grating waveform

Ech › Xch 20mV/div, AC
Fch › Ych 20mV/div, AC

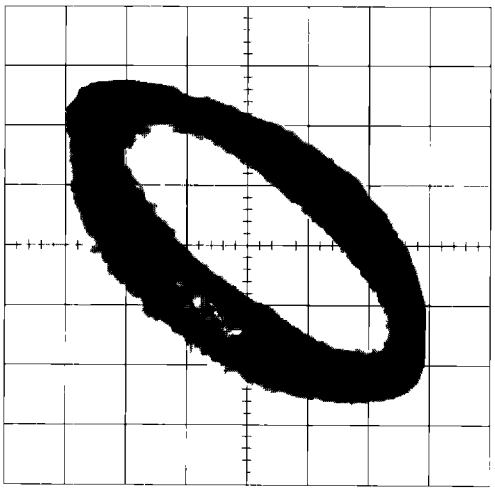
0°



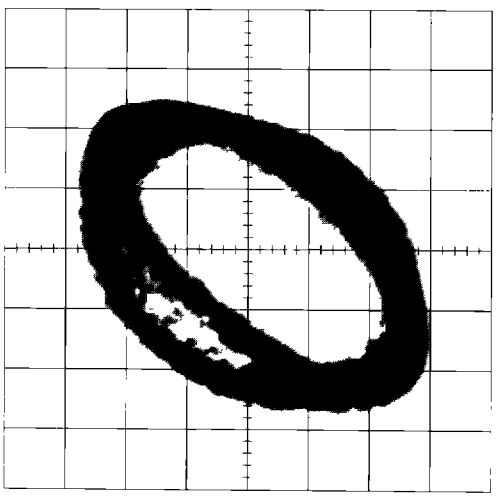
30°



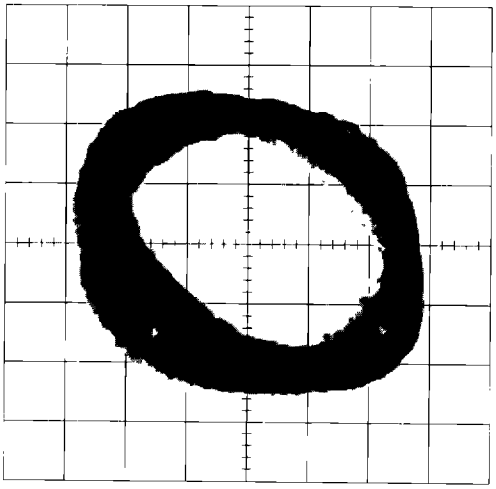
45°



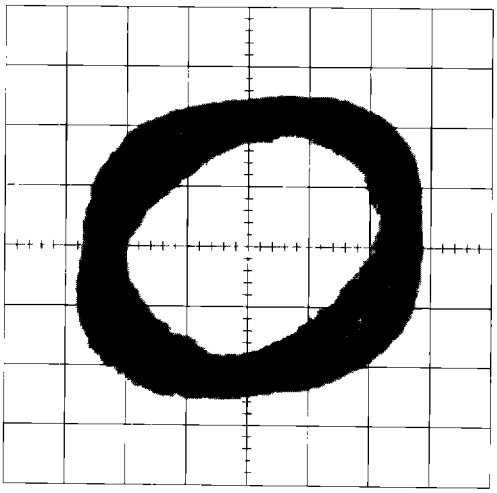
60°



75°

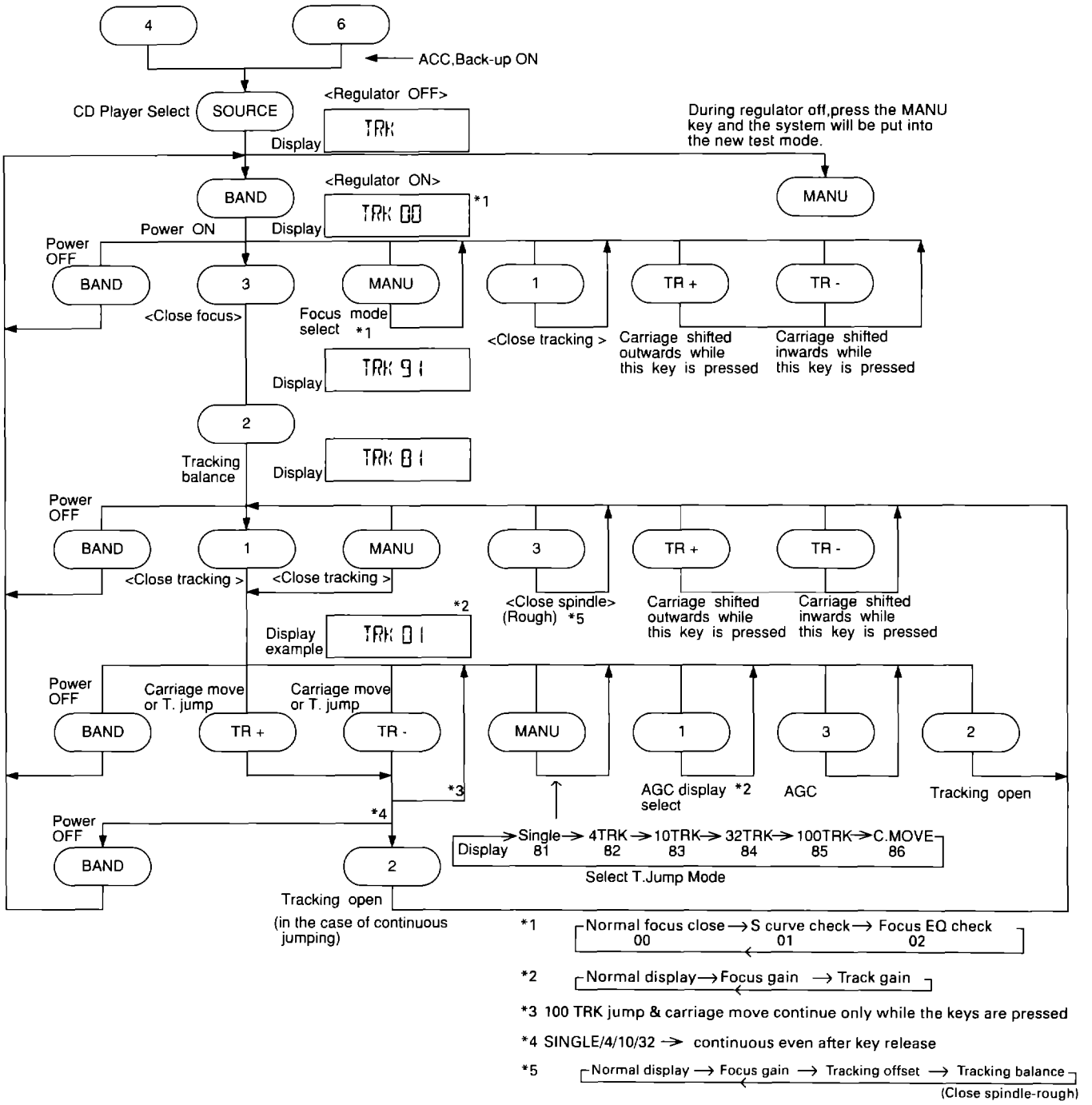


90°



6.4 TEST MODE

● Flow Chart



*1 Normal focus close → S curve check → Focus EQ check
00 01 02

*2 Normal display → Focus gain → Track gain

*3 100 TRK jump & carriage move continue only while the keys are pressed

*4 SINGLE/4/10/32 → continuous even after key release

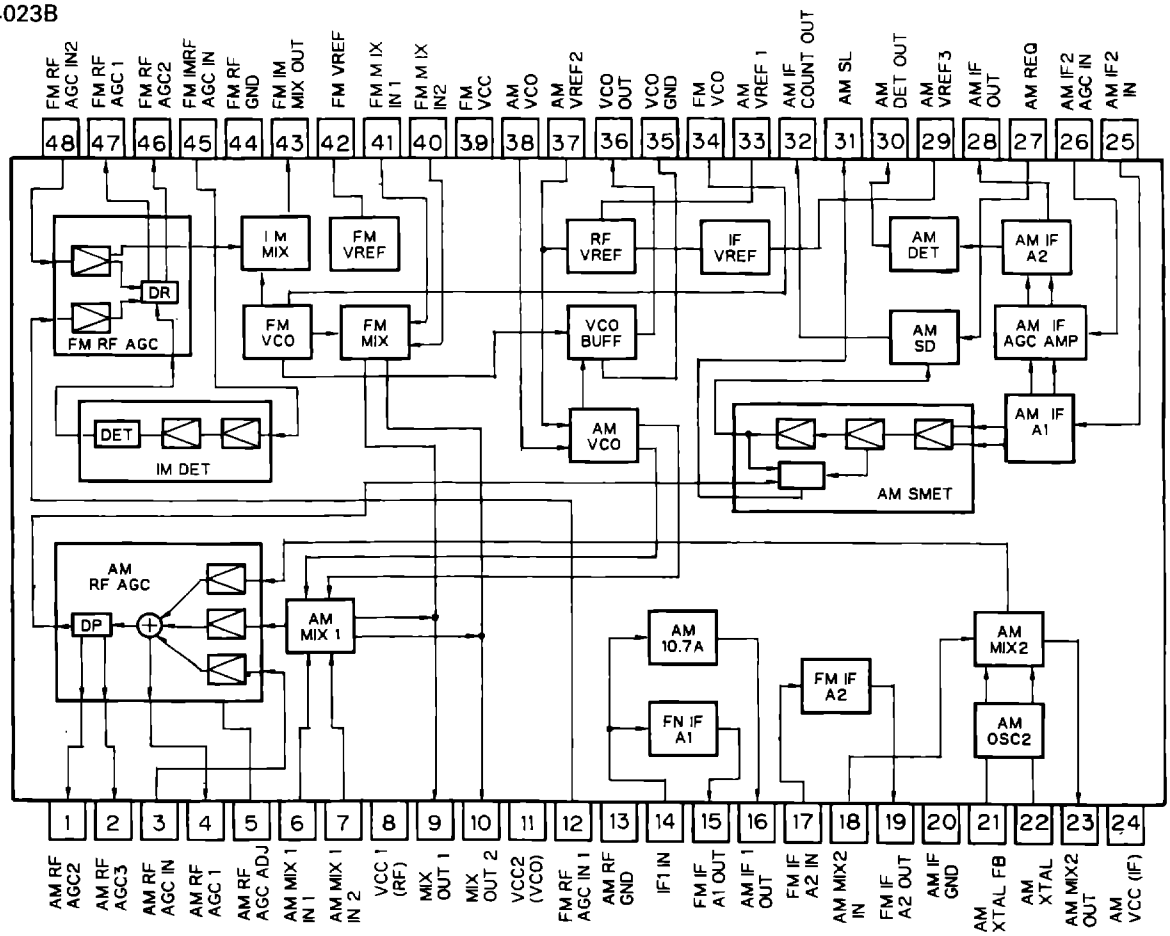
*5 Normal display → Focus gain → Tracking offset → Tracking balance
(Close spindle-rough)

7. GENERAL INFORMATION

7.1 PARTS

7.1.1 IC

PA4023B

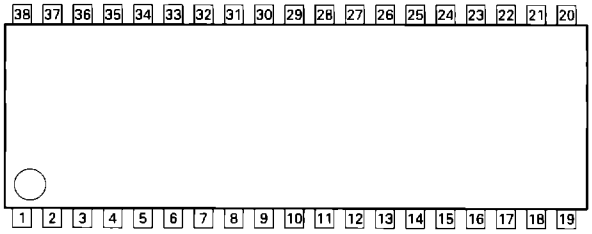


● **Pin Functions (UPC2572GS)**

Pin No.	Pin Name	I/O	Function and Operation
1	EFM-IN	I	EFM comparator input
2	AGC-OUT	O	AGC amplifier output
3	C. AGC		Connects AGC peak detection condenser
4	RF-IN	I	RF signal DC component cut input
5	RF-OUT	O	RF amplifier output
6	RF-	I	RF amplifier inverted input
7	C1, 3T		Connects RF3T component detection condenser
8	C2, 3T		Connects RF3T component detection condenser
9	Vcc		Power supply
10	A	I	A signal input
11	C	I	C signal input
12	B	I	B signal input
13	D	I	D signal input
14	F	I	F signal input
15	E	I	E signal input
16	PD	I	APC amplifier input
17	LD	O	APC amplifier output
18	LDON	I	Laser diode ON/OFF input
19	VREF-OUT	O	Reference voltage output
20	VREF-IN	I	Reference voltage input
21	DET-OUT	O	Vibration detection circuit output

Pin No.	Pin Name	I/O	Function and Operation
22	DET-IN	I	Vibration detection circuit input
23	TE-OUT2	O	Tracking error amplifier output (fourfold gain)
24	TE-OUT1	O	Tracking error amplifier output (singlefold gain)
25	TE-	I	Tracking error amplifier inverted input
26	GND		GND
27	FE-	I	Focus error amplifier inverted input
28	FE-OUT	O	Focus error amplifier output
29	C.FE	I	Focus error signal DC component cut input
30	3T-OUT	O	RF3T component output
31	MIRR	O	MIRR signal output
32	RFOK	O	RFOK signal output
33	DEFECT	O	DEFECT signal output
34	C. DEF		Connects DEFECT signal detection condenser
35	EFM-OUT	O	EFM comparator output
36	ASY	I	EFM comparator level input
37	TE-BAL	I	Tracking balance control
38	FE-BAL	I	Focus balance control

UPC2572GS



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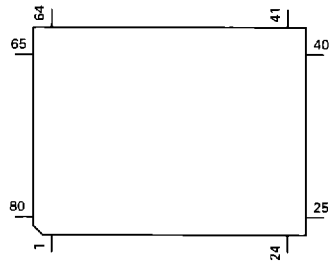


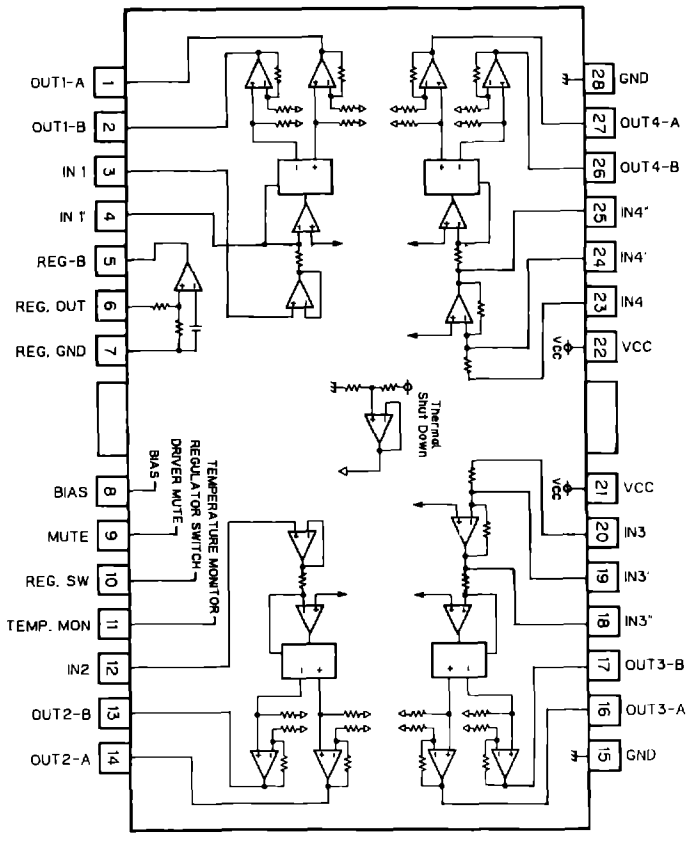
IC's marked by are MOS type.*
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

● Pin Functions (UPD63702GF)

Pin No.	Pin Name	I/O	Function and Operation
1	D.VDD		Supplies current of positive voltage to the logic circuits
2	$\overline{RST}$	I	System reset input pin
3	AO	I	Microcomputer interface AO="L": $\overline{STB}$ active and set to address register AO="H": $\overline{STB}$ active and set to parameter
4	$\overline{STB}$	I	Signal to latch serial data within the LSI
5	$\overline{SCK}$	I	Clock input pin to input and output serial data
6	SO	O	Outputs serial data and status signal
7	SI	I	Serial data input pin
8	D.GND		Logic circuit GND
9	X.GND		Crystal oscillation circuit GND
10	XTAL	I	Crystal oscillator connection pin
11	$\overline{XTAL}$	O	Crystal oscillator connection pin
12	X.VDD		Supplies current of positive voltage to the crystal oscillation circuit
13	DA.VDD		Supplies current of positive voltage to the D/A converter
14	R+	O	Right channel analog audio data output pin
15	R-	O	Right channel analog audio data output pin
16,17	DA.GND		D/A converter GND
18	L-	O	Left channel analog audio data output pin
19	L+	O	Left channel analog audio data output pin
20	DA.VDD		Supplies current of positive voltage to the D/A converter
21	D.VDD		Supplies current of positive voltage to logic circuit
22	FLAG	O	Flag output pin to indicate that audio data currently being output consists of noncorrectable data
23	WDCK	O	Pin to output double the frequency of LRCK
24	C16M	O	Pin to output the clock
25	EMPH	O	Output pin for the pre-emphasis data in the sub-Q code

Pin No.	Pin Name	I/O	Function and Operation
26	DIN	I	Input pin for serial audio data
27	DOUT	O	Output pin for the serial audio data
28	SCKO	O	Output pin for the clock for the serial audio data
29	LRCK	O	Signals to distinguish the right and left channels of the audio data output from DOUT. Frequency is 44.1kHz at 50% duty at normal regeneration
30	TX	O	Output pin for the digital audio interface data
31	CTLV	I	Oscillation control pin for high-frequency clock generation VCO used for the digital PLL upon regeneration at fast speed of 2- or 4-fold
32	POUT	O	Output point for phase comparison
33	D.GND		GND for the logic circuit
34	VCO	I	Input pin for the inverter
35	$\overline{\text{VCO}}$	O	Output pin for the inverter
36	D.VDD		Supplies current of positive voltage to the logic circuit
37	PLCK	O	Pin for monitoring the bit clock
38	LOCK	O	Indicates "H" when the synchronized pattern detection signal matches the frame counter output at the EFM recovery modulation, and "L" when they don't match
39	WFCK	O	Minute-cycle signal for the bit clock, the signal indicates the cycle of 1 frame (approx. 7.35kHz)
40	RFCK	O	Minute-cycle signal for the clock, the signal indicates cycle of 1 frame (approx. 7.35kHz)
41	D.GND		GND for the logic circuit
42,43	TEST0,1	I	Test pins
44,45	TM2, TM4	I	Pins for controlling regeneration at fast speed of 2- or 4-fold
46-49	T4-T7	I	Test pins
50,51	C1D1, C1D2	O	Output pin for indicating the C1 error correction results
52-54	C2D1-C2D3	O	Output pin for indicating the C2 error correction results
55	D.VDD		Supplies current of positive voltage to the logic circuit
56	SFSY	O	Outputs 1 word of the subcode. Generally, 1 cycle is approx 136 micro seconds
57	SBSY	O	The signal indicates the beginning of the subcode block. The SFSY signal is output at high level every 98 times
58	SBSO	O	Output pin for the subcode data
59	SBCK	I	Input pin for the clock signal for read-out of the subcode data
60	A.GND		GND for the analog circuit
61	MD	O	Output pin for the spindle drive
62	SD	O	Output pin for the sled drive
63	TD	O	Output pin for the tracking drive
64	FD	O	Output pin for the focus drive
65	FBAL	O	Output pin for the focus balance control
66	TBAL	O	Output pin for the tracking balance control
67	A.VDD		Supplies current of positive voltage to the analog circuit
68	TBC	I	Switches coefficient banks for the tracking filter
69	EFM	I	Input pin for the EFM signal
70	HOLD	I	Input pin for the hold control signal
71	RFOK	I	Input pin for the RFOK signal
72	MIRR	I	Input pin for the MIRR signal
73	A.GND		GND for the analog circuit
74	HOME	I	Home position detector input
75	VR1	I	The signal input through these pins is digitized to 8-bit by the A/D converter, which by operation of the assigned register, can be read into the microcomputer
76	FE	I	Inputs a focus-error signal from the RF amplifier
77	TE	I	Inputs a tracking-error signal from the RF amplifier
78	TEC	I	Input pin for the tracking comparator
79	REFOUT	O	Output point for midpoint potential for the A/D converter for the LSI portion
80	A.VDD		Supplies current of accurate voltage to the analog circuit

XLA6997FP



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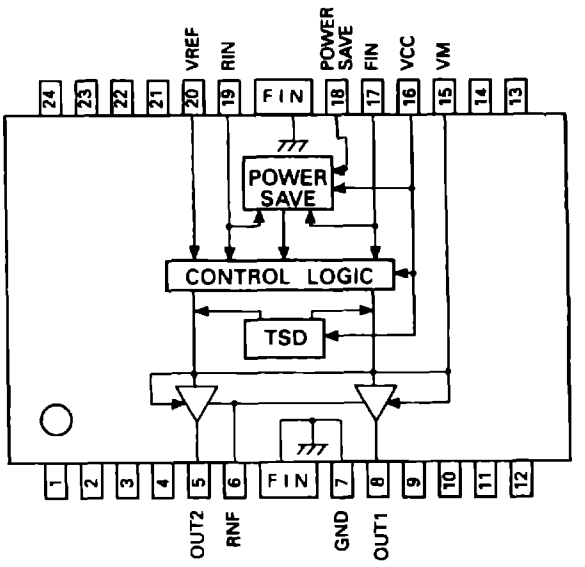

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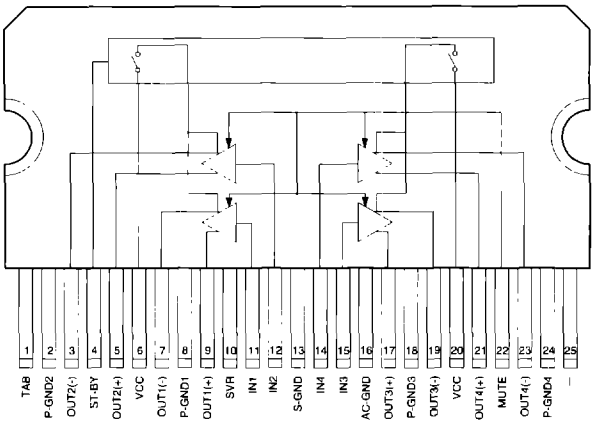

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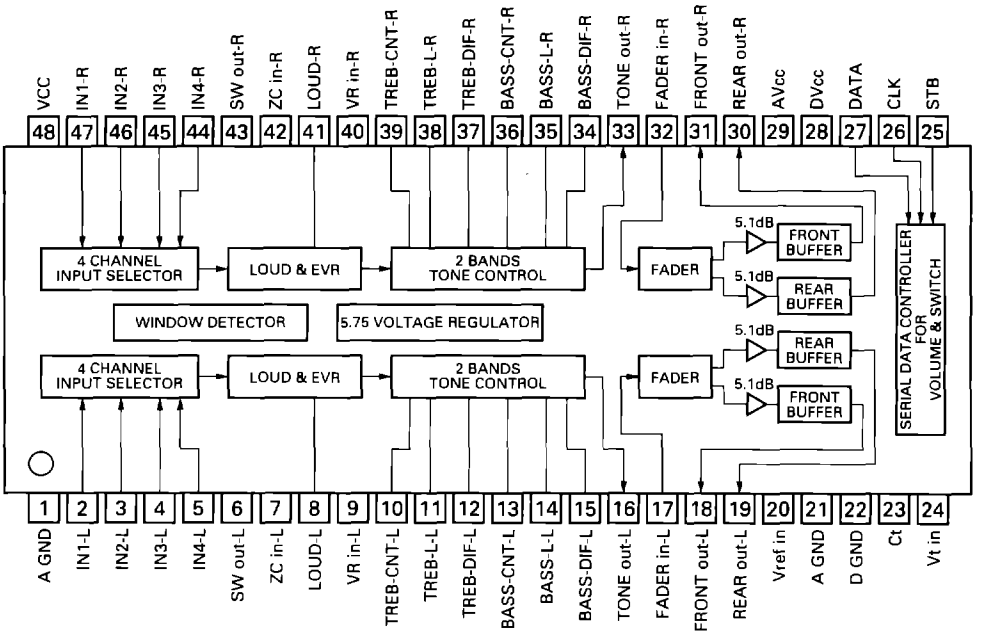

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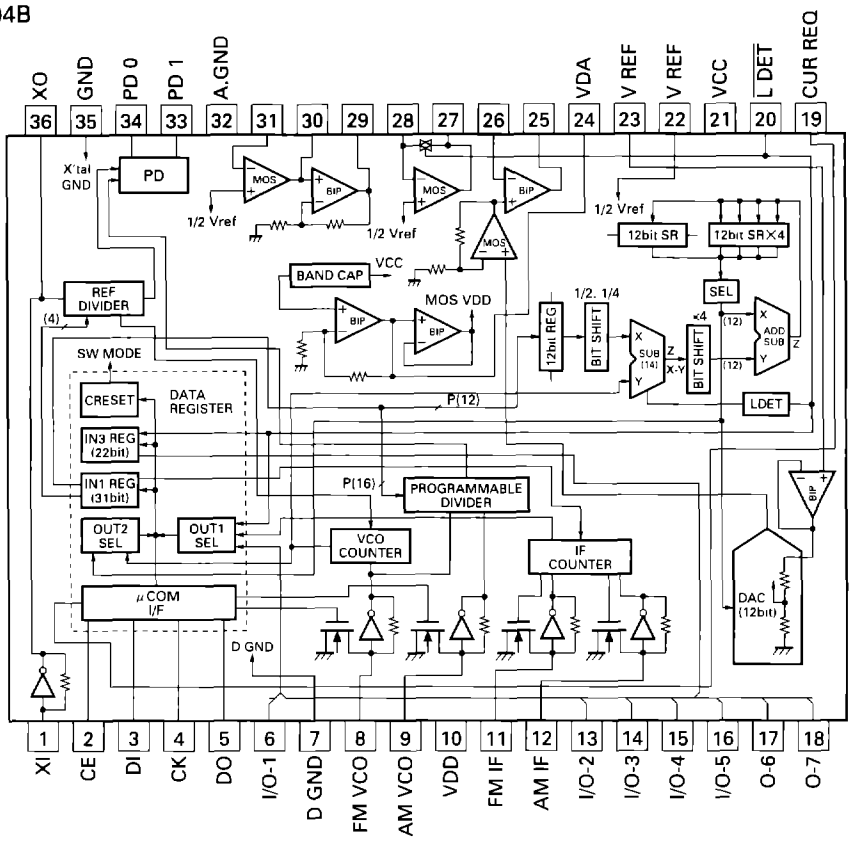
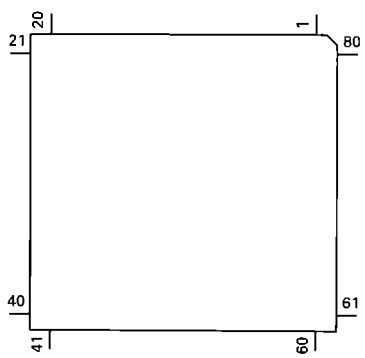


● Pin Functions (PDR027B)

Pin No.	Pin Name	I/O	Format	Function and Operation
1	MODEL1	I		Model select input
2,3	NC			Not used
4	AVSS			GND
5	ST	I		FM stereo input
6	SD	I		SD input
7	AVREF1			A/D converter reference voltage
8	KYDT	I		Key data input
9	DPDT	O	C	Display data output
10	NC			Not used
11	PDI	I		Data input from PLL IC
12	PDO	O	C	Data output for PLL IC
13	$\overline{\text{PCK}}$	O	C	Serial clock output for PLL IC
14	PCE	O	C	Chip enable output for PLL IC
15	$\overline{\text{CURRQ}}$	O	C	Tuner voltage FIX output
16	XSI	I		Data input from CD mechanism module LSI
17	XSO	O	C	Data output for CD mechanism module LSI
18	$\overline{\text{XSCK}}$	O	C	Clock output for CD mechanism module LSI
19	NC			Not used
20	AM	O	C	AM power control output
21	FM	O	C	FM power control output
22	VDCONT	O	C	VD control output
23	CONT	O	C	Servo driver power supply control
24	XAO	O	C	Command/Data output for CD mechanism module LSI
25	$\overline{\text{XRST}}$	O	C	Reset output for CD mechanism module LSI
26	$\overline{\text{XSTB}}$	O	C	Strobe output for CD mechanism module LSI
27	$\overline{\text{CLAMP}}$	I		Disc clamp sense input
28	MIRR	I		Mirror detector input
29	FOK	I		Focus OK signal input
30	LOCK	I		Spindle lock detector input

Pin No.	Pin Name	I/O	Format	Function and Operation
31	CDLOAD	O	C	Load motor loading control output
32	NC			Not used
33	VSS			GND
34	CDEJET	O	C	Load motor eject control output
35	CD5VON	O	C	CD +5V power supply control output
36	$\overline{\text{DLED}}$	O	N	Alarm LED output
37,38	MODEL2,3	I		Model select input
39,40	NC			Not used
41	SWVDD	O	C	Grille power supply control output
42	SYSPW	O	C	System power supply control output
43	ILMPW	O	C	Illumination power supply control output
44	MUTE	O	C	System mute output
45	PEE	O	C	Beep tone output
46	DOORH	O	C	Door system select output
47	DRSENS	I		Door open/close sense input
48	NC			Not used
49	VST	O	C	Strobe pulse output for electronic volume
50	VCK	O	C	Clock output for electronic volume
51	VDT	O	C	Data output for electronic volume
52–54	NC			Not used
55	DRELAY	O	C	External relay output
56	TUNPW	O	C	Tuner power supply control output
57	LPFSW	O	C	Output for FIE
58,59	NC			Not used
60	$\overline{\text{RESET}}$	I		Reset input
61	$\overline{\text{LDET}}$	I		PLL lock sense input
62	NC			Not used
63	$\overline{\text{ASENS}}$	I		ACC power sense input
64	$\overline{\text{BSENS}}$	I		Back up power sense input
65	$\overline{\text{DSENS}}$	I		Grille detach sense
66	CLKIN	I		Clock input
67	NC			Not used
68	VDD			Power supply
69	X2			Crystal oscillator connection pin
70	X1			Crystal oscillator connection pin
71	IC			Connect to GND
72	XT2			Not used
73	TESTIN	I		Test program mode input
74	AVDD			Positive power supply terminal for analog circuit
75	AVREF0			A/D converter reference voltage
76	SL	I		SD level input from tuner
77	TEMP	I		Temperature detect input
78	VDSENS	I		VD power supply short detection input
79	DSCSNC	I		Disc sense input
80	EJTSNC	I		Disc eject position sense input

*PDR027B

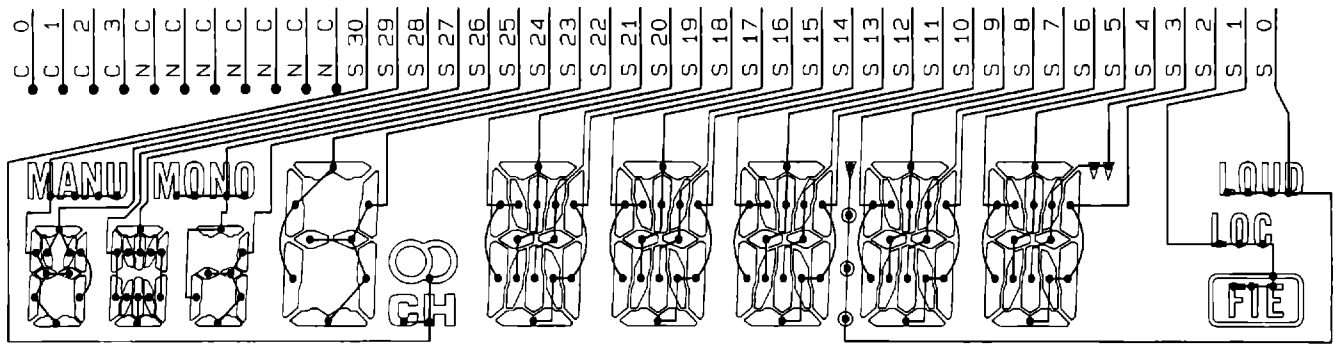


Format	Meaning
C	C MOS
N	N channel open drain

7.1.2 DISPLAY

● **CAW1330**

SEGMENT



COMMON

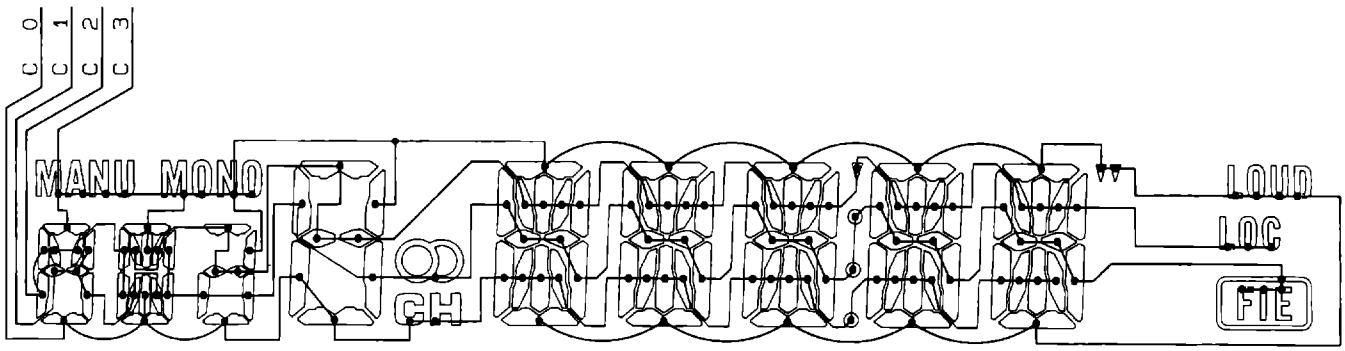


Fig. 30

7.2 DIAGNOSIS

7.2.1 DISASSEMBLY

● Removing the Case(Not shown)

1. Remove the two screws.
2. Insert and turn a flat screwdriver to remove the case.

● Removing the Detach Grille Assy(Fig.31)
(Except for DEH-235/X1M/UC, 236/X1M/ES)

1. Press the detach button, and then pull detach grille Assy.

● Removing the Panel Assy(Fig.31)
(Except for DEH-235/X1M/UC, 236/X1M/ES)

1. Disconnect the two stoppers and then remove the panel assy.

● Removing the CD Mechanism Module
(Fig.31,32)

1. Remove the four screws.
2. Disconnect the connector.
3. Remove the CD Mechanism Module.

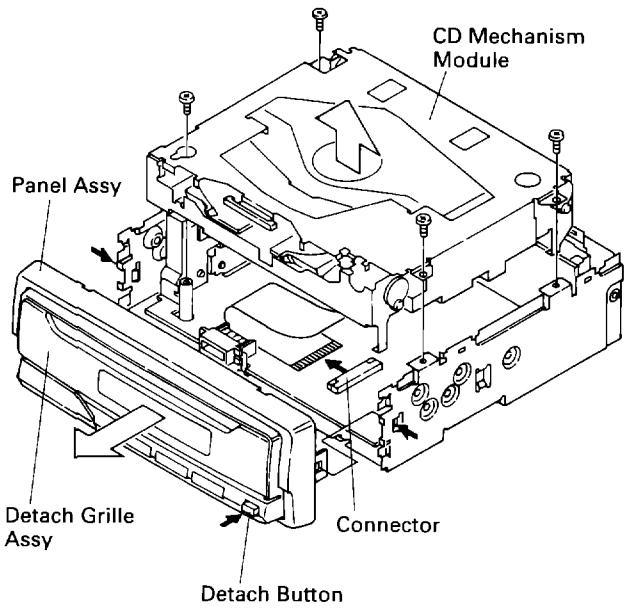


Fig. 31

● Removing the Grille Assy(Fig.32)
(DEH-235/X1M/UC, DEH-236/X1M/ES)

1. Disconnect the connector.
2. Disconnect the two stoppers indicated by arrows, and then remove the grille assy.

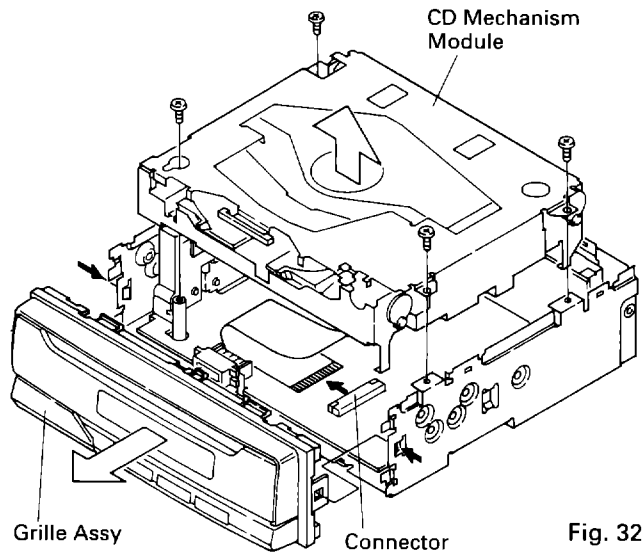


Fig. 32

● Removing the Chassis Unit(Fig.33)

1. Remove the screw A, screw B, screw C and two screws D.
2. Stretch the five claws.
3. Remove the cord, and then remove the chassis Unit.

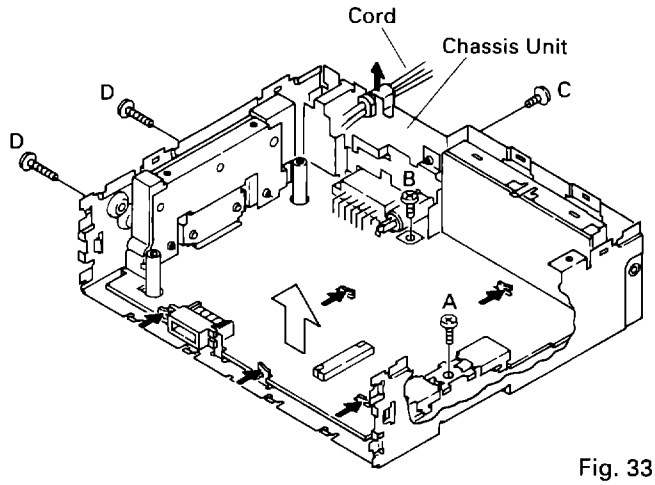


Fig. 33

7.2.2 TEST MODE

● Error Number Indication

If the CD should fail to operate or if an error has taken place during operation the player will enter into the error mode, and the cause of the error will be numerically indicated.

This is aimed at assisting in analysis or repair.

(1) Basic Means of Display

·With ERROR indicated in "MODE" on IP-BUS Display data, an error code is transmitted by the use of MIN and SEC. The MIN and SEC data will be identical.

·Examples of Display ER-XX

(2) Error Codes

Error Code	Classification	Description	Cause/Detail
10	ELECTRIC	Carriage home failure	Carriage doesn't move to or from the innermost position →Home switch failed and/or carriage immobile
11	ELECTRIC	Focus failure	Focus failed →Defects, disc upside-down, severe vibration
12	ELECTRIC	SETUP failure Subcode failure	Spindle failed to lock or subcode unreadable →Spindle defective, defect, severe vibration
14	ELECTRIC	Mirror failure	Unrecorded CD-R The disc is upside-down, defects, vibration
17	ELECTRIC	Set up failure	AGC protect failed →Defects, disc upside-down, severe vibration
19	ELECTRIC	Set up failure	Tracking error waveform is too unbalanced (>50%) or level is too small →The P.U.unit or tracking error circuitry is N.G.
30	ELECTRIC	Search time out	Failed to reach target address →Carriage/tracking defective and/or defects
A0	SYSTEM	Power failure	Power overvoltage or short circuit detected →Switching transistor defective and/or power abnormal

"defects" means scratches, dirt etc an the surface of the disc.

● New Test Mode(aging operation and setup analysis)

The single CD player plays in normal mode. After being set up, it will display FOK (focus), LOCK (spindle), subcode, sound skip, protection against a mechanical error or the like, occurrence of an error, cause and time of an expiry, if any, (and disk number).

During the setup, the CD software operation status (internal RAM and C-point)is displayed.

(1) How to enter NEW TEST Mode

See the test mode flow chart Page 65.

(2) Relations of keys between TEST and NEW TEST Modes

Keys	Test Mode		New Test Mode	
	Regulator OFF	Regulator ON	PLAY in progress	Error Occurred, Protection Activated
BAND	Regulator ON	Regulator OFF	—	Time of occurrence / cause of error select
TR+	—	FWD-Kick	TRACK+ / FF	—
TR-	—	REV-Kick	TRACK- / REV	—
1	—	Tracking close	SCAN	—
2	—	Tracking open	REPEAT	—
3	—	Focus close	RANDOM	—
MANU	To New Test Mode Select	Focus Mode	AUTO/MANU	TRACK No./ time of occurrence select

Operations, such as EJECT, CD ON/OFF, etc. are performed normally.

(3) Error Cause (Error Number) Code

Error Code	Classification	Mode	Description	Cause	Detail
40	ELECTRIC	PLAY	FOK=L 100ms	Put out of focus	Scratch, Stain, Vibration, Servo defect, etc...
41	ELECTRIC	PLAY	LOCK=L 100ms	Spindle unlock	
42	ELECTRIC	PLAY	Subcode unacceptable 500ms	Failed to read subcode	
43	ELECTRIC	PLAY	Sound skipped	Last address memory operated	

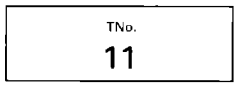
(4) Indicating an Operation Status During Setup

Status No.	Description	Protection operation
01	Carriage home mode started	None
02	Carriage moving inwards	10-second time out, Home switch failed
03	Carriage moving outwards	10-second time out, Home switch failed
05	Carriage moving outwards	None
11	Setup started	None
12	Spindle turn/Focus search started	None
13	Waiting for focus closure (XSI=L)	Failure to close focus
10,14	Waiting for focus closure (FOK=H)	Failure to close focus
15, 16, 17	Focus closed, Tracking open	Focus disrupted
18	During focus AGC Subcode waiting	Focus disrupted
19	During tracking AGC	Disrupted focus
20	Waiting for MIRR, LOCK or subcode read Carriage closed, SPINDLE=ADAPTIVE	Focus disrupted, MIRR NG, Failure to lock, Failed to read subcode

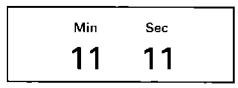
5) Example of Display.

·SET UP in progress

Auto



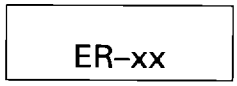
Manual



·Operation (PLAY, SEARCH, etc.) in progress perfectly identical with that in the normal mode.

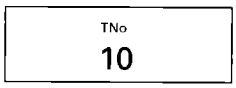
·Protection/Error upon occurrence

(a)Error number indicated

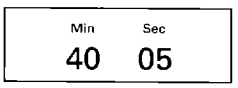


Select the display with the BAND key.

(b)Track number indicated



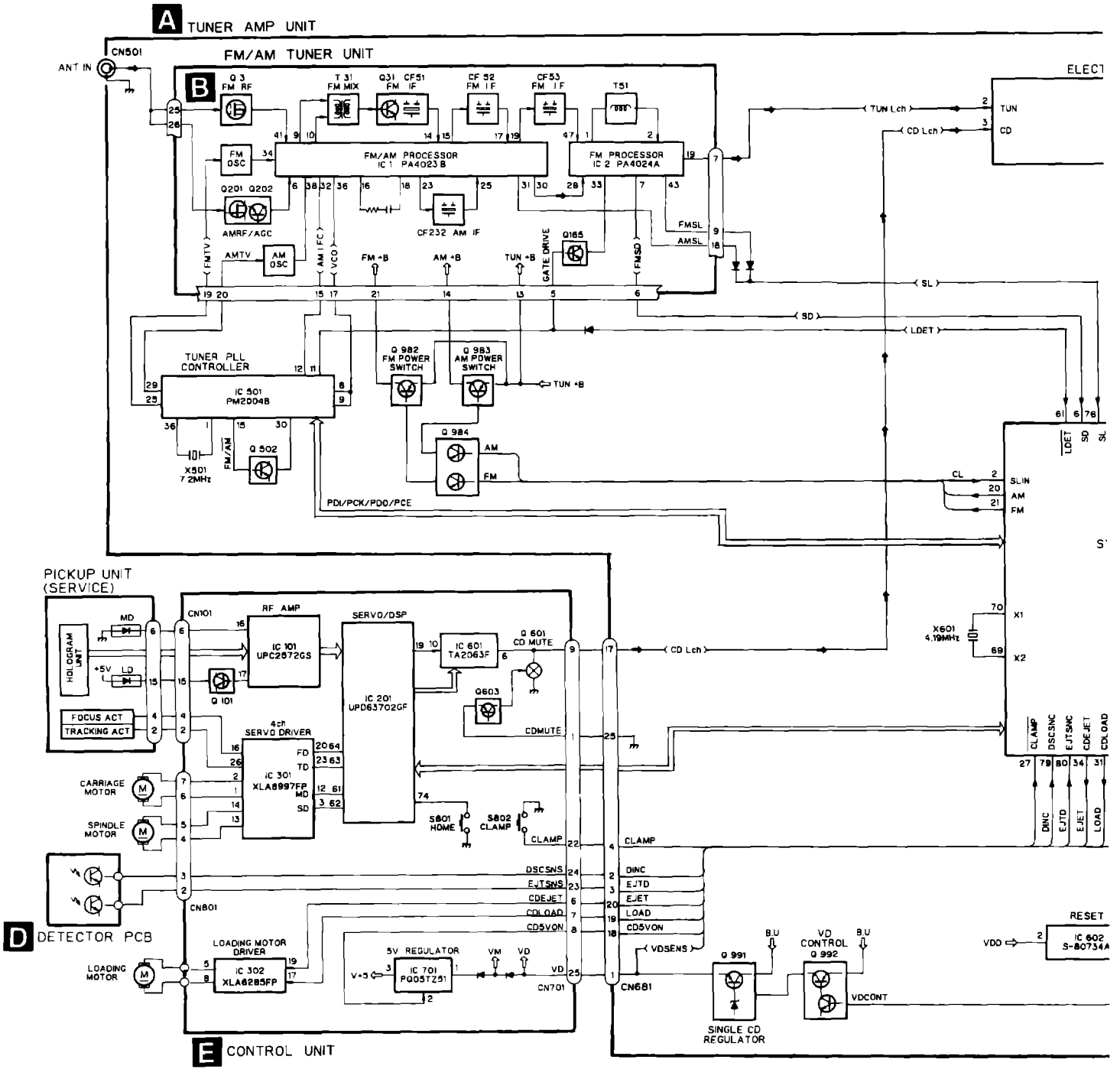
(c)Absolute time indicated



Select the display with the MANU key.

7.3 BLOCK DIAGRAM

● DEH-48/X1M/UC



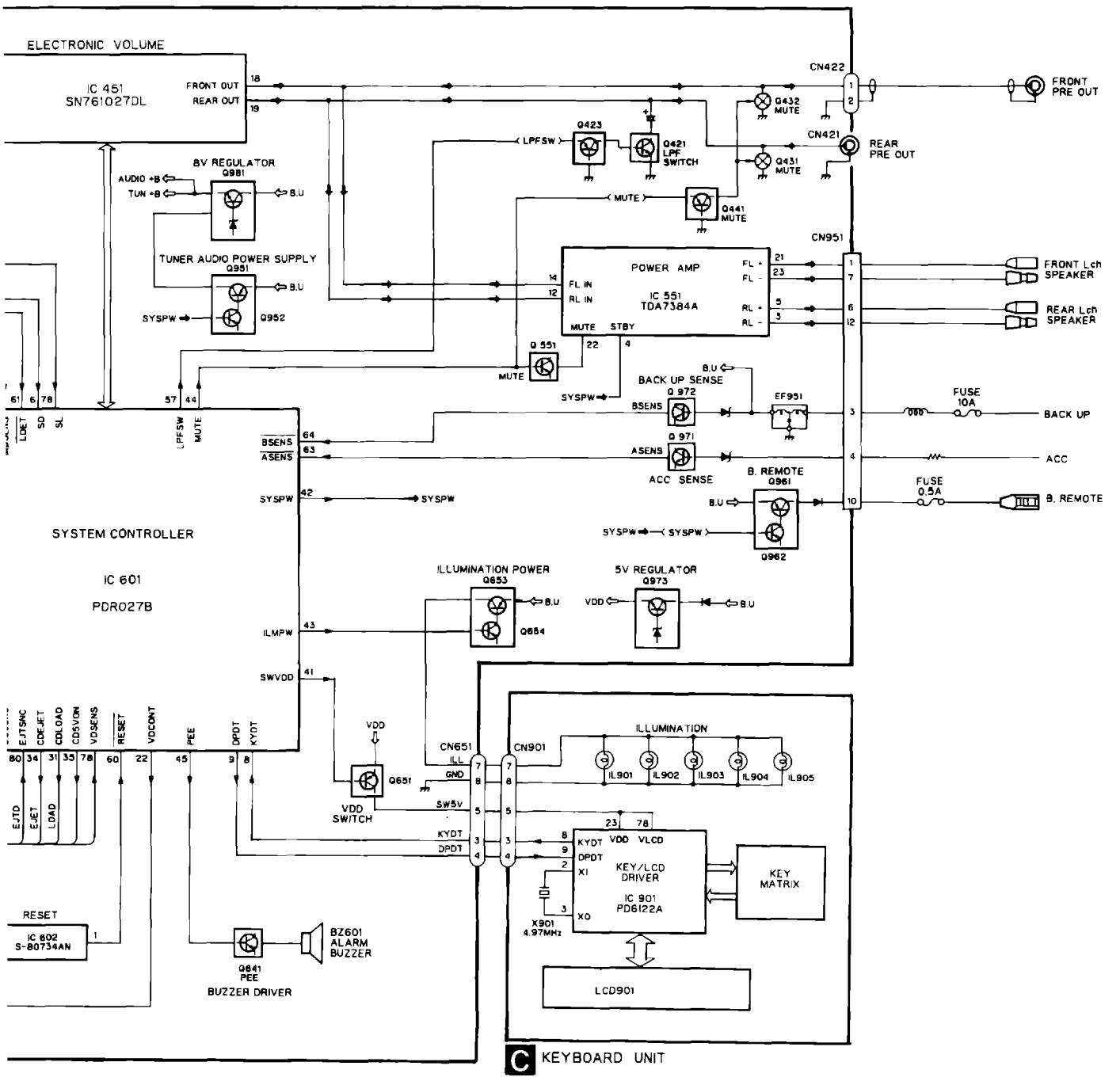

ELECTRONIC VOLUME
IC 451
SN761027DL
FRONT OUT
REAR OUT
8V REGULATOR
Q981
AUDIO +B
TUN +B
B.U
TUNER AUDIO POWER SUPPLY
Q951
Q952
SYSPW
CN422
FRONT PRE OUT
Q432 MUTE
Q423
LPFSW
Q421 LPF SWITCH
CN421
REAR PRE OUT
Q431 MUTE
MUTE
Q441 MUTE
CN951
POWER AMP
IC 551
TDA7384A
FL IN
RL IN
MUTE
STBY
FL +
FL -
RL +
RL -
FRONT Lch SPEAKER
REAR Lch SPEAKER
Q 551
BACK UP SENSE
Q 972
BSENS
EF951
FUSE 10A
BACK UP
Q 971
ASENS
ACC SENSE
ACC
B. REMOTE
Q961
FUSE 0.5A
B. REMOTE
Q962
SYSTEM CONTROLLER
IC 601
PDR027B
ILLUMINATION POWER
Q653
Q654
5V REGULATOR
Q973
VDD
ILMPW
SWVDD
VDD SWITCH
Q651
CN651
CN901
ILLUMINATION
IL901
IL902
IL903
IL904
IL905
GND
SW5V
KYDT
DPDT
KEY/LCD DRIVER
IC 901
PD6122A
VDD
VLCD
XI
XO
X901
4.97MHz
KEY MATRIX
LCD901
RESET
IC 602
S-80734AN
Q641
PEE
BUZZER DRIVER
BZ601
ALARM BUZZER
C KEYBOARD UNIT

Fig. 34

8. OPERATIONS AND SPECIFICATIONS

● Connection Diagram

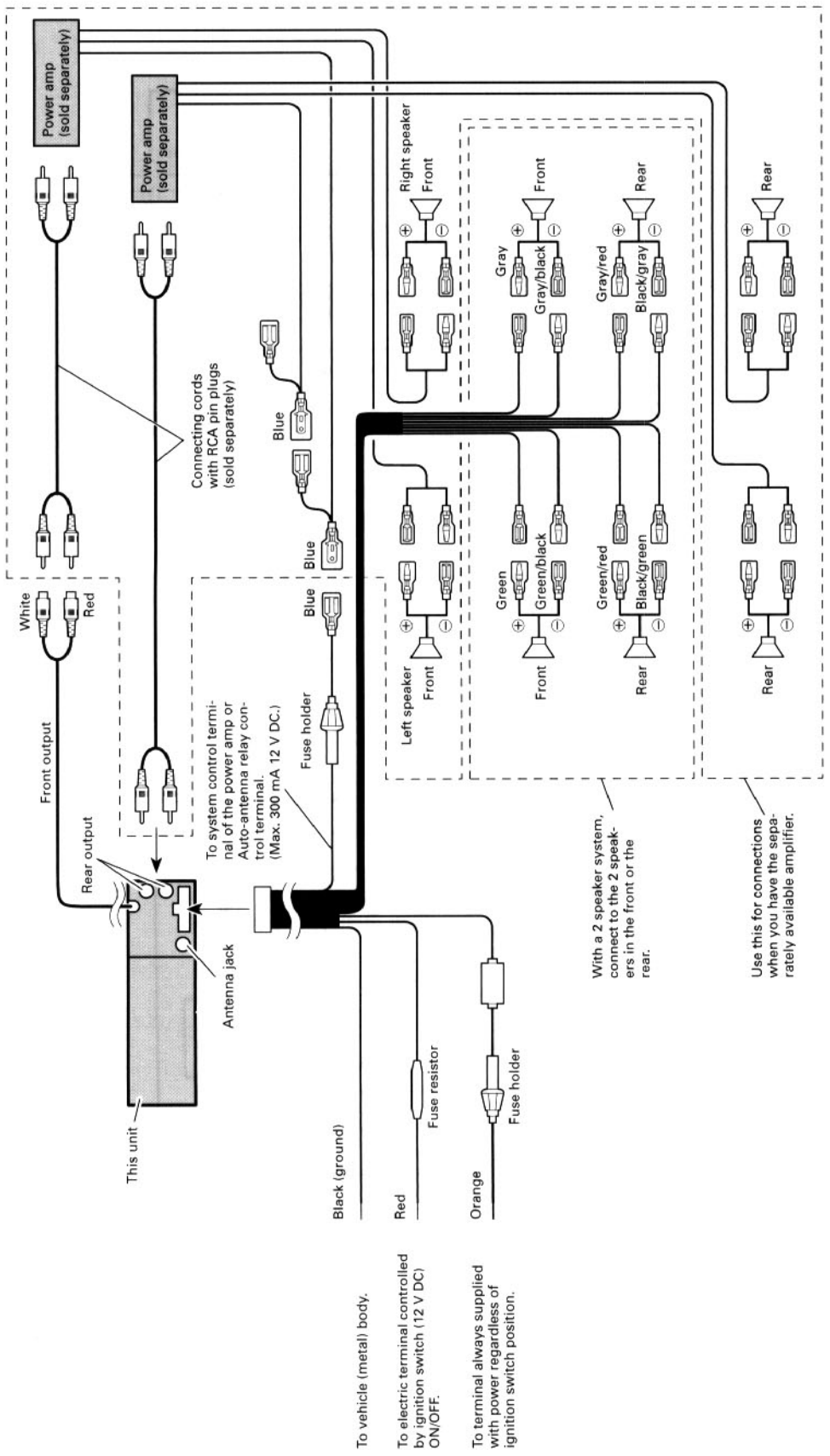


Fig. 35

Audio Adjustment

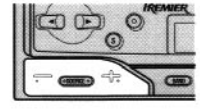
The audio modes are selected for adjustment with the S button. Volume adjustment is the default mode. When another mode is selected for adjustment, the setting returns to the Volume mode after 8 seconds.

Volume Adjustment

- **Press the (+) button or the (–) button repeatedly to raise or lower the volume.**

  The display shows low to high volumes from "VOL00" to "VOL30."

  Note: Holding down the buttons increases or decreases the volume level more rapidly.



Using the F. I. E. function

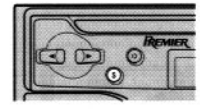
The F. I. E. (Front Image Enhancer) function is a simple method of enhancing front imaging by cutting mid- and high-range frequency output from the rear speakers, limiting their output to low-range frequencies.

Note: When the F. I. E. function is deactivated, the rear speakers output sound in all frequencies, not only bass sounds. Reduce the volume before disengaging F. I. E. to prevent a sudden increase in volume.

1. **Press the S button once to select the F. I. E. mode.**

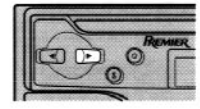
   "FIE" appears on the display.

   After adjustment use the S button to return to the normal display.

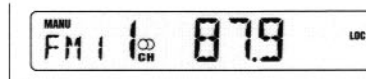


2. **Press the (►) button to activate the F. I. E. function.**

   "FIE" is displayed and "FIE" indicator lights on the display.



Tuner Operation



Tuner Source and Band

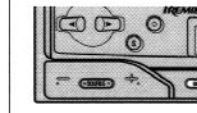
- **Push the SOURCE button to select Tuner.**

  The Frequency appears on the display.

  ("ST" indicator lights when stereo station selected.)

- **Use the BAND button to select the desired band.**

  (FM1, FM2, FM3, AM)

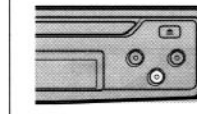


Manual and Seek Tuning

Both Manual (step-by-step) and Seek (automatic) tuning are available.

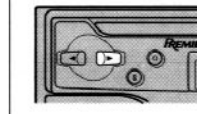
1. **Press the MANU button to switch alternately between the Manual and Seek tuning modes.**

   The "MANU" indicator lights when Manual tuning is selected and turns OFF when Seek tuning is selected.

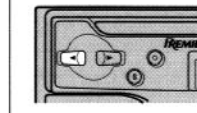


2. **Press the (►) button to tune the receiver to a higher frequency.**

   MANU ON (Manual tuning):
   The frequency changes step by step.
   MANU OFF (Seek Tuning):
   The tuner automatically seeks out and receives broadcasting stations.



- **Press the (◄) button to tune the receiver to a lower frequency.**



Audio Adjustment

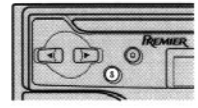
Bass/Treble Adjustment

This tuner/CD player is equipped with two tone adjustment modes, the Bass Adjustment and Treble Adjustment modes.

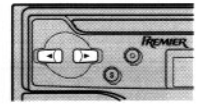
1. Press the S button 3 times to select tone adjustment mode.

"BAS" or "TRE" appears on the display.

After adjustment use the S button to return to the normal display.

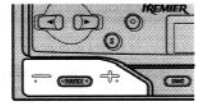


2. Press the (◄) button or the (►) button to select "Bass Adjustment mode" or "Treble Adjustment mode".



3. Press the (+) button or the (–) button, respectively, to increase or decrease the intensity of the bass or treble, whichever is selected.

The display shows "+6"—"–6".



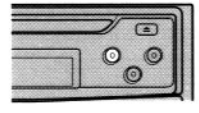
4. Repeat steps 2-3 above for the other Bass or Treble Adjustment mode.

Loudness Adjustment

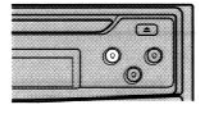
The Loudness function compensates for deficiencies in the low and high sound ranges at low volume.

- **Press the LOUD button to activate the Loudness function.**

  "LOUD" indicator lights.

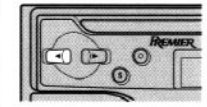


- **To cancel the Loudness function, press the LOUD button again.**



- **To cancel the F. I. E. function, press the (◄) button.**

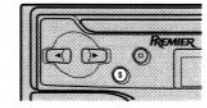
  "FIE" indicator OFF.



3. Use the S button to select the Fader/Balance mode.

This function adjusts the front and rear speaker volumes for better balanced listening.

(Refer to next section.)



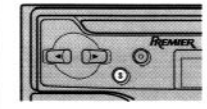
Balance Adjustment

The function allows you to select a Fader/Balance setting that provides ideal listening conditions in all occupied seats.

1. Press the S button 2 times to select the Fader/Balance mode.

"F-" or "B-" appears on the display.

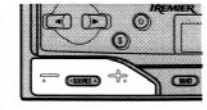
After adjustment use the S button to return to the normal display.



2. Press the (+) button or the (–) button to shift the balance progressively to the front or rear speakers.

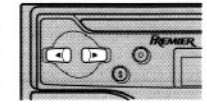
"F-F15" ~ "F-R15" is displayed as it moves from front to rear.

Note: "F-0" is the proper setting when 2 speakers are in use.



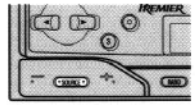
3. Press the (◄) button or the (►) button to shift the balance to the left or right speaker, respectively.

"B-L9" ~ "B-R9" is displayed as it moves from left to right.



- **To stop CD playback, press the SOURCE button to select the tuner or turn the source OFF.**

  When the built-in CD player is selected again, playback begins at approximately the same place (track/playing time).



Precaution:

* Inserting more than one disc at a time may damage the built-in CD player.
* Discs left partially inserted after ejection may incur damage or fall out.
* If a disc cannot be inserted fully or playback fails, make sure the recorded side is down, push the Eject button and check the disc for damage before reinserting it.
* If a CD is inserted with the recorded side up, it will be ejected automatically after a few moments.
* If the built-in CD player cannot operate properly, an error message (such as ER-14) appears on the display. Refer to "CD Player Troubleshooting".

CD Player Troubleshooting

When problems occur with CD playback, an error message appears on the display. Refer to the table below to identify the problem, then take the suggested corrective action. If the error persists, contact your dealer or your nearest PIONEER Service Center.

Message	Possible cause	Recommended action
ER- 11, 12, 14, 17, 30	Dirty disc.	Clean the disc.
ER- 11, 12, 17, 30	Scratched disc.	Replace the disc.
ER- 14	Unrecorded CD.	Check the disc.
ER- 10, 11, 12, 14, 17, 30, A0	Electrical or mechanical problem.	Turn the ignition ON and OFF, or switch to a different source, then back to the CD player.
HEAT	CD player overheating.	Discontinue play until the machine temperature drops.

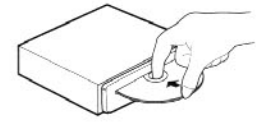
Using the Built-in CD Player

The built-in CD player plays one standard 12 cm or 8 cm (single) CD at a time. Do not use an adapter when playing 8 cm CD.

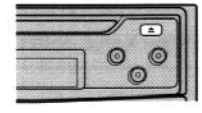
Inserting and Removing Discs

- **Insert the disc with the recorded (iridescent) surface down.**

  CD playback begins immediately, whether or not the player is ON or the built-in CD source selected. The track number and playing time are displayed.



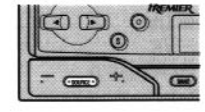
- **Press the Eject button to eject any disc loaded in the disc slot.**



Playing the Built-in CD player

- **To play a CD that is already loaded, press the SOURCE button with a CD loaded to select the built-in CD player.**

  The built-in CD player is selected only when a CD is loaded.



  Note: See "Audio Adjustment" on pages 12-14 for volume and tone adjustment.

Specifications

General

Power source ..... 14.4 V DC (10.8 — 15.1 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 10.0 A
Dimensions
(DIN) (chassis) ..... 178 (W) × 50 (H) × 150 (D) mm
[7 (W) × 2 (H) × 5-7/8 (D) in.]
(nose) ..... 188 (W) × 58 (H) × 22 (D) mm
[7-3/8 (W) × 2-1/4 (H) × 7/8 (D) in.]
(D) (chassis) ..... 178 (W) × 50 (H) × 155 (D) mm
[7 (W) × 2 (H) × 6-1/8 (D) in.]
(nose) ..... 170 (W) × 48 (H) × 17 (D) mm
[6-3/4 (W) × 1-7/8 (H) × 5/8 (D) in.]
Weight ..... 1.5 kg (3.3 lbs)

Amplifier

Continuous power output is 15 W per channel min. into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.
Maximum power output ..... 35 W × 4
Load impedance ..... 4 Ω (4 — 8 Ω allowable)
Preout output level/output impedance ..... 500 mV/ 1 kΩ
Tone controls
(Bass) ..... ±12 dB (100 Hz)
(Treble) ..... ±12 dB (10 kHz)
Loudness contour ..... +10 dB (100 Hz), +7 dB (10 kHz)
(volume: –30 dB)

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal format ..... Sampling frequency: 44.1 kHz
Number of quantization bits: 16; linear
Frequency characteristics ..... 5 — 20,000 Hz (±1 dB)
Signal-to-noise ratio ..... 94 dB (1 kHz)(IHF-A network)
Dynamic range ..... 90 dB (1 kHz)
Number of channels ..... 2 (stereo)

FM tuner

Frequency range(Except for DEH-436/X1M/ES, 236/X1M/ES)
..... 87.9 — 107.9 MHz
Frequency range(DEH-436/X1M/ES, 236/X1M/ES) ..... 87.5 — 108 MHz
Usable sensitivity ..... 11 dBf (1.0 μV/75Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity ..... 16 dBf (1.7 μV/75Ω, mono)
Signal-to-noise ratio ..... 70 dB (IHF-A network)
Distortion ..... 0.3% (at 65 dBf, 1 kHz, stereo)
Frequency response ..... 30 — 15,000 Hz (±3 dB)
Stereo separation ..... 40 dB (at 65 dBf, 1 kHz)
Selectivity ..... 70 dB (2ACA)
Three-signal intermodulation
(desire signal level) ..... 50 dBf (two undesire signal level: 110 dBf)

AM tuner

Frequency range(Except for DEH-436/X1M/ES, 236/X1M/ES)
..... 530 — 1,710 kHz
Frequency range(DEH-436/X1M/ES, 236/X1M/ES)..... 531 — 1602 kHz
Usable sensitivity ..... 18 μV (25 dB) (S/N: 20 dB)
Selectivity ..... 50 dB (±10 kHz)

Note:
Specifications and the design are subject to possible modification without notice due to improvements.

PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
CRT1829

CD MECHANISM MODULE

CX-597

- **This service manual describes the operation of the CD mechanism incorporated in models listed in the table below.**
- **When performing repairs use this manual together with the specific manual for model under repair.**

Model	Service Manual	CD Mechanism Module	CD Mechanism Unit
DEH-P825R/EW, DEH-P825/UC DEH-P823/ES, DEX-P99/UC	CRT1805	CXK5011	CXA8880
DEH-P725R/EW, DEH-P725R-W/EW DEH-P725/UC, DEH-P725-W/UC DEH-P723/ES, DEH-P625/UC DEX-P88/UC, DEX-P77R/EW	CRT1812	CXK5001	CXA8870
DEH-625R/EW, DEH-624R/EW DEH-525R/EW, DEH-524R/EW DEH-424R/GR, DEH-424/EW DEH-425/IT	CRT1808	CXK5001	CXA8870
DEH-59/UC, DEH-52/UC DEH-525/UC, DEH-49/UC DEH-42/UC, DEH-425/UC DEH-225/UC, DEH-523/ES DEH-323/ES, DEH-223/ES	CRT1809	CXK5001	CXA8870

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PIONEER ELECTRONICS ASIACENTRE PTE.LTD. 501 Orchard Road, #10-00, Lane Crawford Place, Singapore 0923

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1. THE SUMMARY OF CIRCUITS

1.1 PRE-AMP SECTION (UPC2572GS: IC101)

This section processes the pickup output signals to create the signals for the servo, demodulator & control.

The pickup output signals are I-V converted by the pre-amp with built in photo-detector in the pickup, and added by the RF amp (IC101) to obtain the RF, FE, TE, TE zero cross, and other signals.

The main component is the UPC2572GS and each section is explained below. Because this system has a single power supply (+5V), the reference voltage for this IC, the PU and the servo circuit is the voltage REFO (+2.5V). The REFO signal is obtained by buffering REFOUT from the servo LSI (IC201: UPD63702GF) and is available from Pin 19 of IC101. All measurements should be done using this REFO as reference.

Note: During measurement, do not short REFO and GND.

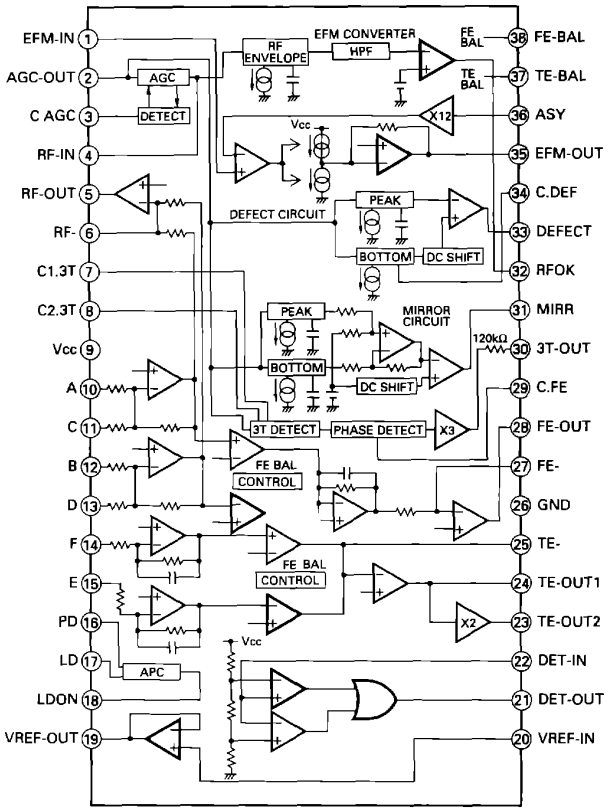


Fig.1 : UPC2572GS BLOCK DIAGRAM

1) APC Circuit (Automatic Power Control)

When the laser diode is driven with constant current, the optical output has large negative temperature characteristics. So the current must be controlled to hold the output constant with the monitor diode. The circuit that carries out this function is the APC circuit. The LD current is obtained by measuring the voltage between LD1 and ground and the value of this current is about 35mA.

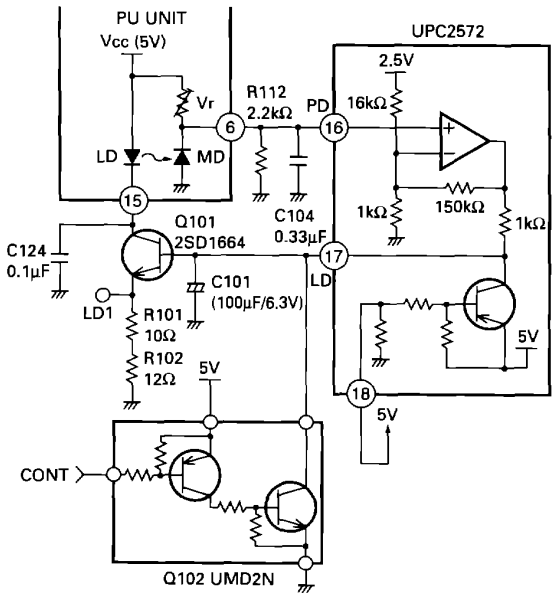


Fig.2 : APC CIRCUIT

2) RF Amp, RF AGC Amp

The photo-detector outputs (A+C) and (B+D) are added, amplified, and equalized in IC101 and output to the RFI pin. (The eye pattern can be checked at this pin.)

The RFI voltage low-frequency component is:

RFI = (A+B+C+D) × 3.22

R111 is the offset resistor for holding the RFI signal in the pre-amp's output range. The RFI signal is AC coupled and input to Pin 4 (RFIN pin).

This IC contains an RF AGC circuit, which holds the RFO output at Pin 2 at a fixed level (1.2 ± 0.2Vp-p). This RFO signal is used in the EFM, DFCT, and MIRR circuits.

3) EFM Circuit

This circuit, "squares" up the analog RF signal into a digital EFM signal. In order to ensure minimum errors it is necessary to use a feedback circuit to match the DC level of the threshold to the center of the RF waveform.

This circuit uses the fact that the EFM signal should have no DC component. By feeding back the EFM signal's DC level the threshold level changes until the DC level is zero and the threshold, by definition, is at the exact center of the RFO waveform. The filtering in the feedback has been adjusted to ensure minimum error. The EFM signal is output from Pin 35. The signal is a 2.5Vp-p amplitude signal centering on REFO.

4) DFCT (Defect) Circuit

The DFCT circuit detects defects on the disc surface, and outputs a "H" signal from Pin 33.

If there is dirt on the disc, drop outs may appear. The DFCT signal output is input to the servo LSI HOLD pin and the focus and tracking servo drives are held while the DFCT output is "H" in order to improve playability.

5) RFOK Circuit

This circuit produces the signal indicating the focus close state during play and the timing for closing the focus servo. This signal is output from Pin 32. This RFOK signal output is input to the servo LSI RFOK pin and the focus close command is issued by the servo LSI. This signal is high during play when the focus is closed.

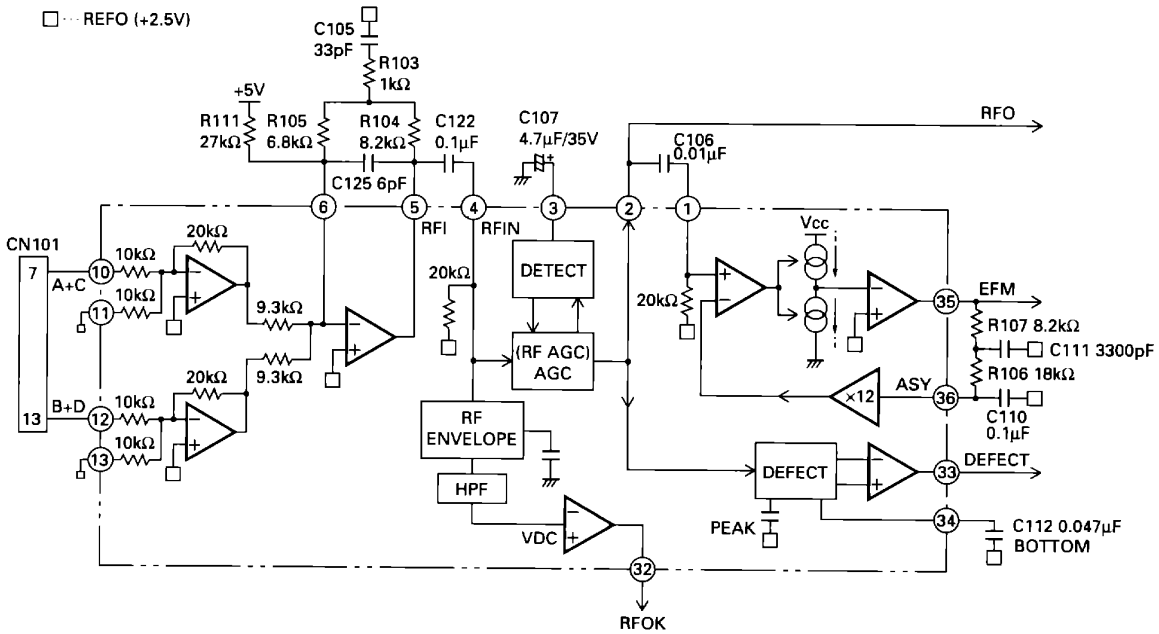


Fig.3 : RF AMP, RF AGC, EFM, DFCT, RFOK CIRCUIT

6) Focus Error Amp

The photo-detector outputs (A+C) and (B+D) are passed through a differential amp, and an error amp and (A+C-B-D) is output from Pin 28 as the FE signal.
The FEY voltage low-frequency component is:

$$FEY = (A+C-B-D) \times \frac{20k\Omega}{10k\Omega} \times \frac{90k\Omega}{68.8k\Omega} \times \frac{R108}{17.2k\Omega}$$

: (PU FE level × 5.02)

An S curve of about 1.6Vp-p is obtained with REFO as the reference. The final-stage amp cutoff frequency is 12.4kHz.

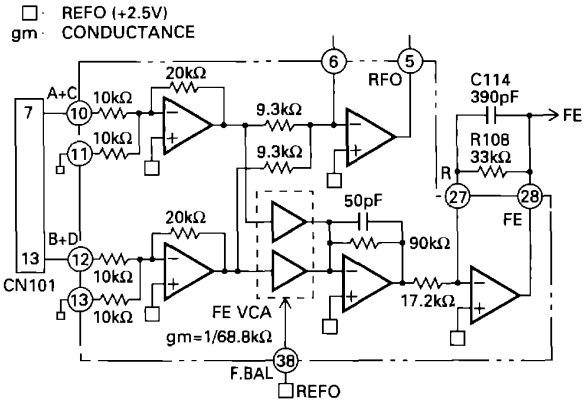


Fig.4 : FOCUS ERROR AMPLIFIER

7) Tracking Error Amp

The photo-detector E and F outputs are passed through a differential amp and an error amp and (E-F) is output from Pin 24 as the TE signal.
The TEY voltage low-frequency component is:

$$TEY = (E-F) \times \frac{63k\Omega}{(31k\Omega+16k\Omega)} \times \frac{R109}{17k\Omega}$$

: (PU TE output level × 5.36)

The TE waveform of about 1.5Vp-p with REFO as the reference is obtained as the TE output (Pin 24). The final-stage amp cutoff frequency is 19.5kHz.

8) Tracking Zero Crossing Amp

The tracking zero crossing signal (below, TEC signal) is the TE waveform (Pin 24 voltage) amplified four times and is used to find the zero crossing points of the tracking error with the UPD63702GF servo LSI. This zero crossing point is found for the following two reasons.

(1) To count tracks for carriage moves and track jumps
(2) To detect the direction in which the lens is moving for tracking closing (This is used in the tracking brake circuit, described Page 9 b).)

The TEC signal frequency range is 500Hz - 19.5kHz.

TEC voltage = TE level × 4

In other words, the TEC signal level is calculated at 6Vp-p. This level exceeds the op-amp's output range and the signal is clipped, but this can be ignored because this signal is used by the servo LSI only at the zero crossing point.

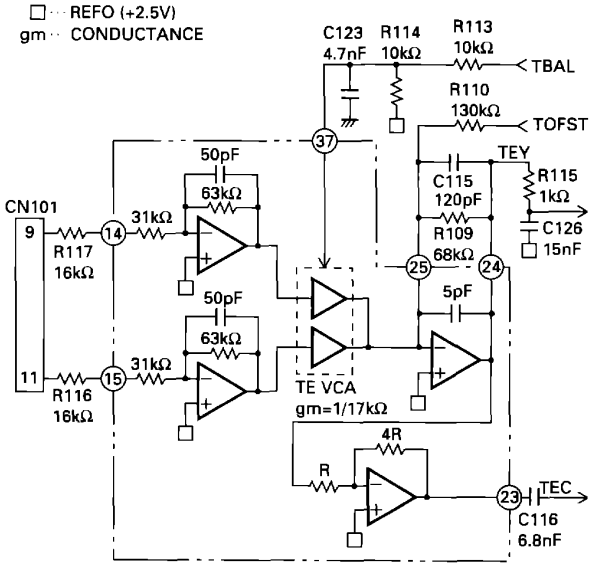


Fig.5 : TRACKING ERROR AMPLIFIER & TRACKING ZERO CROSSING AMPLIFIER

9) MIRR (Mirror) Circuit

The MIRR signal shows the on track and off track data and is output from Pin 31.

When the laser beam is

On track: MIRR = "L"

Off track: MIRR = "H"

This signal is used in the brake circuit, described Page 9 b).

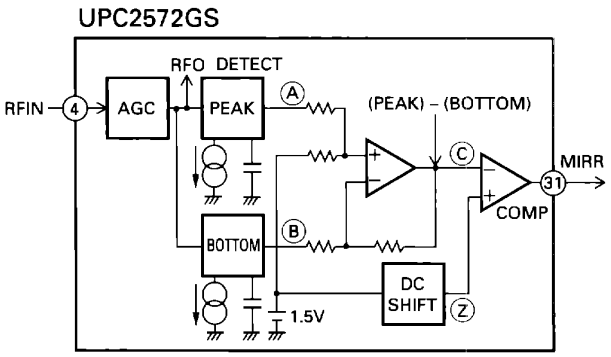


Fig.6 : MIRR CIRCUIT

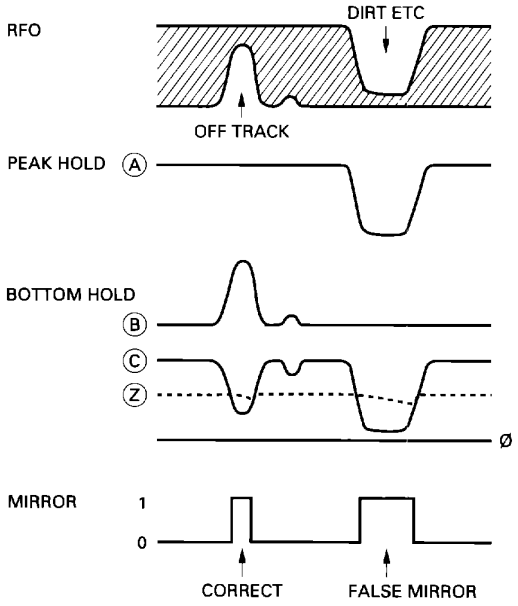


Fig.7 : MIRR CIRCUIT & SIGNAL DIAGRAM

10) 3TOUT Circuit

This circuit detects variations of the RF signal when an external interference is input into the focus servo loop and outputs the phase difference between the FE signal and the RF level variation signal from Pin 30. The signal has been passed through a low-pass filter (fc = 40Hz). This signal is used for the FE bias automatic adjustment, described Page 12 4).

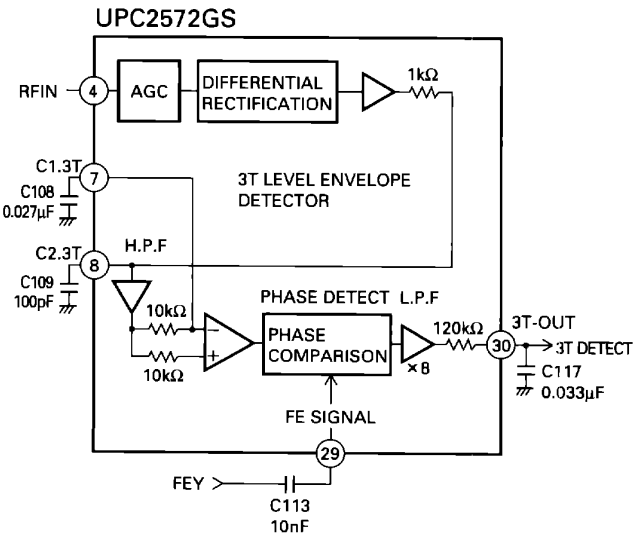


Fig.8 : 3T OUT CIRCUIT

1.2 SERVO SECTION (UPD63702GF: IC201)

This section can be divided into two parts.
One is the servo processing section, which handles such servo controls as error signal equalizing, in focus, track jump, and carriage move. The other is the signal processing section, which handles data decoding, error correction, and interpolation processing.
This IC converts the FE and TE signals from analog to digital and outputs the focus, tracking, and carriage drive signals via the servo block. Also, the EFM signal from the pre-amp is decoded in the signal processing section and finally output as audio signals after D/A conversion. (This IC has a built in audio digital-analog converter.) The decoding process also creates the spindle servo error signals, which is fed to the spindle servo block to create the spindle drive signal.
The focus, tracking, carriage, and spindle drive signals are then amplified by IC301, XLA6997FP and fed to their respective actuators and motors.

1) Focus Servo System

The main focus servo equalizer is in the UPD63702GF. Figure 9 is the focus servo block diagram.
In the focus servo system, the lens must be brought within the in-focus range for focus closing. Therefore, the lens is raised and lowered according to the triangular focus search voltage to find the focus point. During this time the spindle motor is kicked and kept rotating at a set speed.
The servo LSI monitors the FE signal and the RFOK signal and automatically carries out the focus close operation at the appropriate point.
Focus closing is carried out when the following four conditions are all met.
(1) The lens is moving from far to near toward the disc surface.
(2) RFOK = H
(3) The FZD signal (within the IC) is latched at high.
(4) FE = 0 (REFO reference)

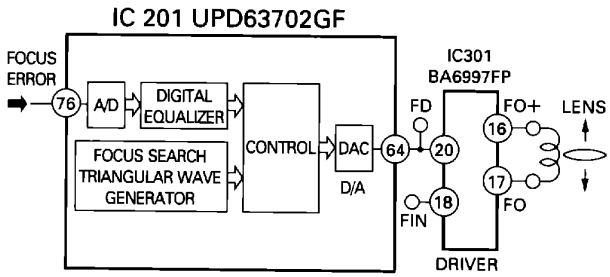


Fig.9 : FOCUS SERVO BLOCK DIAGRAM

When the above conditions are all met and the focus is closed, the XSO signal is shifted from high to low, then 40ms later, the microcomputer begins to monitor the RFOK signal that is passed through the low pass filter.
When the RFOK signal is judged to be low, the microcomputer carries out various actions such as protection.
Figure 10 shows the series of operations for focus closing (for the case where focus cannot be closed.) Also, in focus-mode-selection during test mode when the display is 01, if the focus close button is pressed, the S curve, search voltage, and actual lens movements can be checked.

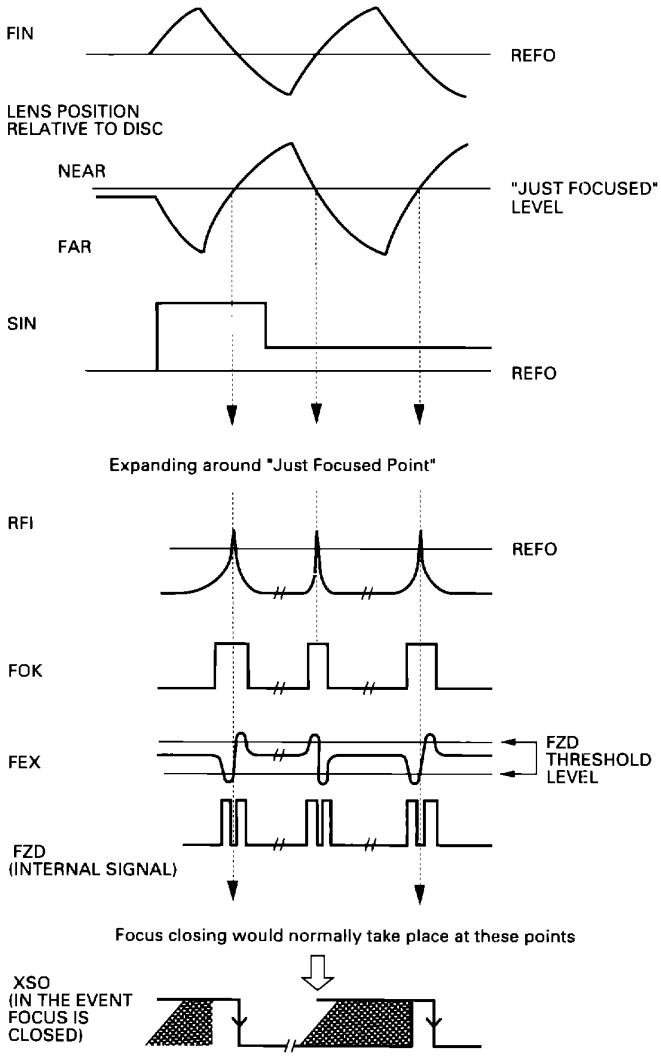


Fig.10 : FOCUS CLOSING SEQUENCE

2) Tracking Servo System

The main tracking servo equalizer is in the UPD63702GF. Figure 11 is the tracking servo block diagram.

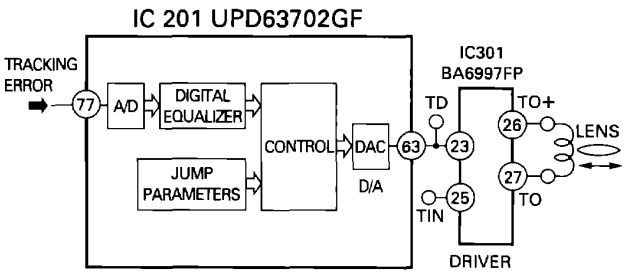


Fig.11 : TRACKING SERVO BLOCK DIAGRAM

a) Track Jump

When the LSI receives the track jump command from the microcomputer, the track jump is carried out automatically by the auto sequence function within the LSI. This system has six types of track jumps used for searches: 1, 4, 10, 32, 32 × 2, and 32 × 3. In test mode, in addition to these jumps, CRG moves can be executed and checked by mode selection. For track jumps, the microcomputer sets half of the total number of jumps (2 tracks for a 4 track jump) and counts the set number of tracks using the TEC signals. From the point when it has counted the set number of tracks, it outputs the brake pulse for a fixed period of time (set by the microcomputer) to stop the lens. In this way, it can close the tracking and continue normal play.

To improve the servo loop re-closing performance just after track jump, the brake circuit comes on for 60ms after the end of the brake pulse and the tracking servo gain is increased.

Fast forward and reverse operations in normal mode are realized by executing consecutive single track jumps. The speed is about 10 times as high as in normal play.

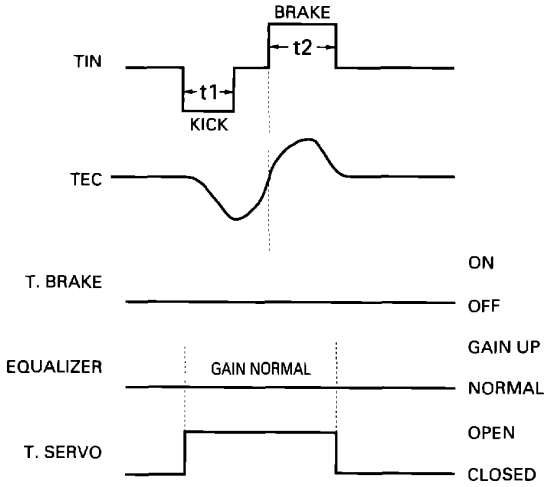


Fig.12 : SINGLE TRACK JUMP

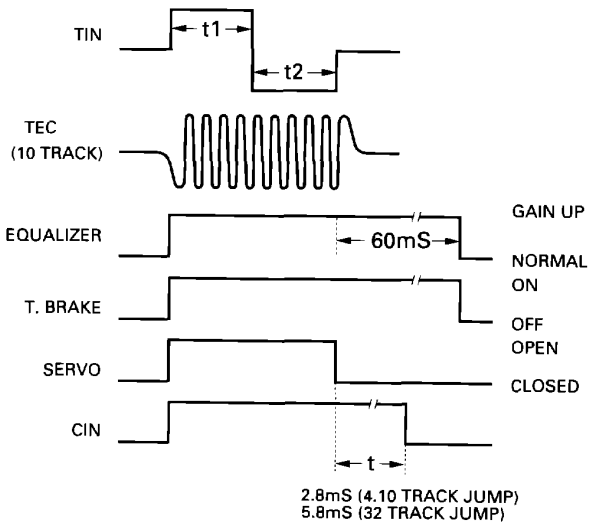
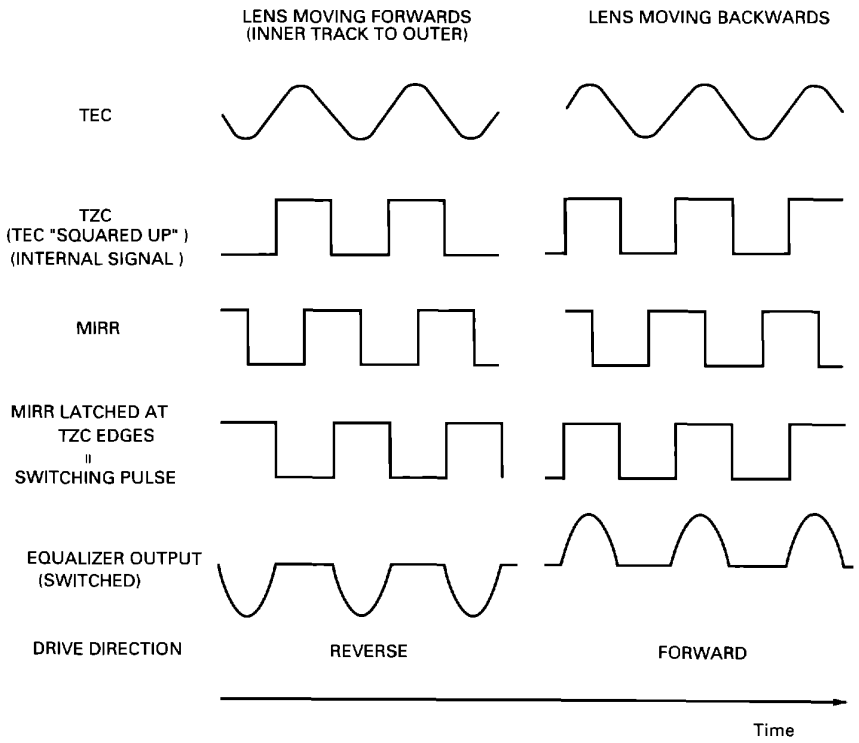


Fig.13 : MULTI-TRACK JUMP

b) Brake Circuit

This relies on determining which direction the lens is moving and only outputting the portion of the drive waveform which acts to oppose this motion. Direction of motion is deduced from TEC and the MIRR signal and knowledge of their phase relation.



Note: Equalizer output assumed to hava same phase as TEC.

Fig.14 : TRACKING BRAKE CIRCUIT

3) Carriage Servo System

The carriage servo supplies the tracking equalizer's low-frequency component (lens position information) output to the carriage equalizer and after applying a fixed amount of gain, outputs the drive signal from the servo LSI. This signal is applied to the carriage motor through the driver IC.

When the lens offset reaches a certain level during play, the entire PU must be moved in the forward direction. Therefore, the equalizer gain is adjusted to output a voltage higher than the carriage motor starting voltage. In actual operations, a certain threshold level is set for the equalizer output within the servo LSI and the drive voltage is output from the servo LSI only when the equalizer output level exceeds that threshold level. This reduces power consumption. Also, due to disc eccentricity and other factors, the equalizer output voltage may cross the threshold level a number of times before the entire PU starts to move. In this case, the drive voltage waveform, (which is applied) from the LSI, becomes pulsative.

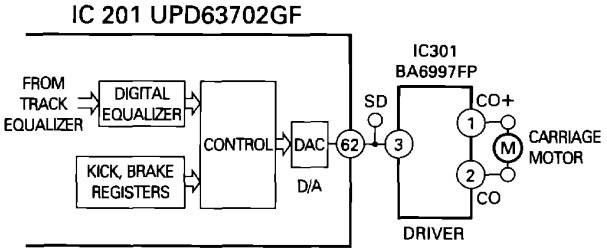


Fig.15 : CARRIAGE SERVO CIRCUIT

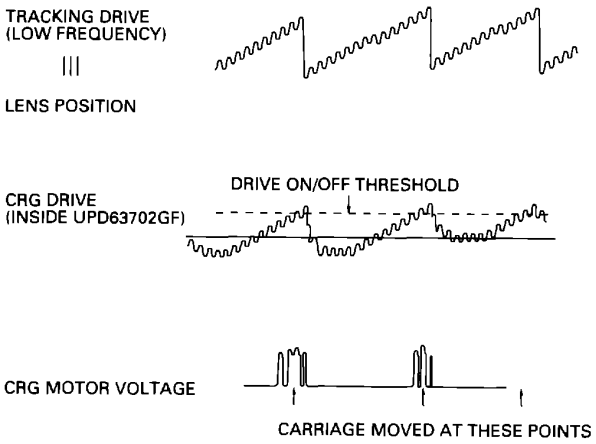


Fig.16 : CARRIAGE WAVEFORM

4) Spindle Servo System

The spindle servo has the following modes.

(1) Kick: The mode used for disc rotation acceleration during setup

(2) Offset:

a) Used during setup from the end of kick until the AGC end

b) Used during play when the focus is unlocked until it is recovered

Both of these are for holding the disc rotation rate near the normal rotation rate.

(3) Adaptive servo: CLV servo mode for normal operation

In the EFM demodulation block, the frame sync signal and internal frame counter output signal are sampled each WFCK/16 and a signal is produced indicating whether or not they match. Only after this signal is in non-match mode eight consecutive times, is the system treated as out of sync, at other times it is treated as in sync. In this adaptive servo mode, a servo mode for pulling the system into sync is automatically selected when the system is out of sync and the regular servo is automatically selected when the system is in sync.

(4) Brake: The mode for stopping the spindle motor rotation

The brake voltage is output by the microcomputer from the servo LSI. At this time, the EFM wave form is monitored within the LSI and if the longest EFM pattern exceeds a certain interval (when the rotation is slow enough), a flag is registered within the LSI and the microcomputer switches the brake voltage off. If the flag is not registered within a certain period of time, the microcomputer switches from brake mode to stop mode which lasts for a fixed period of time. In this case, ejection of the disc can only occur after this period of time.

(5) Stop: The mode used during power on and ejection

At this time, the voltage across the spindle motor is 0V.

(6) Rough servo: The mode used for carriage feed (carriage move during a long search)

The linear speed is calculated from the EFM wave form and a high level or low level is input to the spindle equalizer. In test mode, this mode is also used for the grating check.

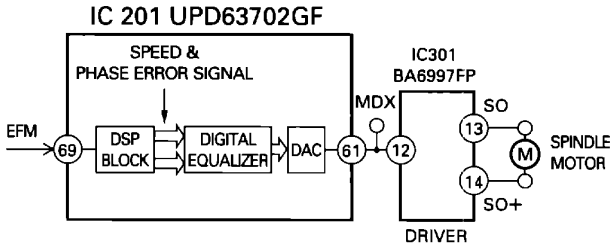


Fig.17 : SPINDLE SERVO BLOCK DIAGRAM

1.3 AUTOMATIC ADJUSTMENT FUNCTIONS

This system uses a pre-amp (UPD2572GS) and servo LSI (UPD63702GF) to automate all circuit adjustment. All adjustments are carried out automatically each time a disc is inserted or the CD mode is selected with the source key. Here is how each automatic adjustment works.

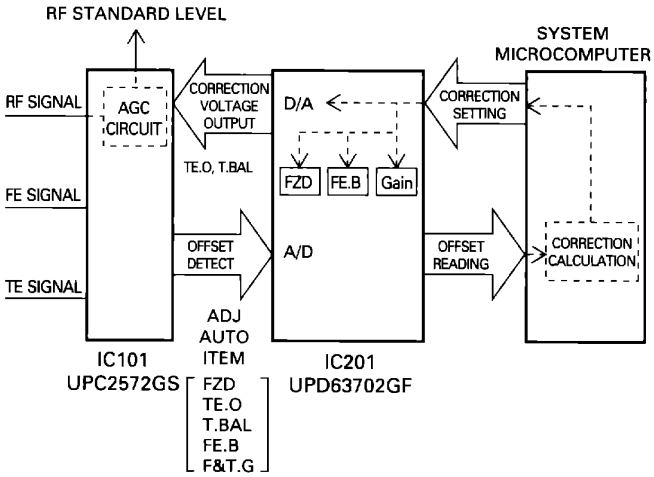


Fig.18 : AUTOMATIC GAIN CONTROL

1) FZD Cancel Setting

This setting is to make the focus closing reliable. When the power is switched on, the FE offset level is read and a voltage opposite to this offset value is written to the CRAM in the IC to cancel the offset. In this way, the FZD threshold level can be set to a constant value (+150mV) and one of the conditions within the IC for focus closing "that the FZD signal is latched at high" can be fulfilled reliably.

2) TE Offset Automatic Adjustment

This function adjusts the pre-amp TE amp offset to 0 V when the power is switched on.

The adjustment procedure is:

(1) The TE offset (LD off) is read by the microcomputer via the servo LSI (offset = TE1).

(2) The microcomputer calculates the voltage to be corrected from the value of TE1 and sets the output of Pin 65 of the servo LSI (signal name: TOFST). The concrete calculation method is as follows.

TOFST2 = TOFST1 + TE1 × R110/R109

3) Tracking Balance Automatic Adjustment

This adjustment equalizes the difference in sensitivity of the E channel and F channel of the TE output. In actual practice, the TE waveform is adjusted to be vertically symmetrical about REFO.

The adjustment procedure is:

(1) After focus closing, the lens is kicked in the radial direction to reliably generate the TE waveform.

(2) At this time, the microcomputer reads the peak and bottom of the TE waveform through the servo LSI.

(3) The microcomputer calculates the value of the offset and the correction voltage to output from Pin 66 of the servo LSI (signal name: TBAL).

(4) The voltage output from the servo LSI is input to Pin 37 of the pre-amp (IC101: UPC2572). This pin is the TEVCA amp control voltage pin. The gain for the E channel and F channel within the pre-amp is varied according to the input voltage to adjust the tracking balance and make the TE waveform vertically symmetrical about REFO.

4) FE Bias Automatic Adjustment

This adjustment is made to maximize the RFI level during play by optimizing the focus point. This adjustment utilizes the phase difference between the RF waveform 3T level signal and the focus error signal. Since an external interference is input into the focus loop, this adjustment uses the same timing as the auto gain control, explained below.

The adjustment procedure is:

(1) External interference is injected into the focus loop by command from the microcomputer (within the servo LSI).

(2) The RF signal 3T component level variation is detected within the pre-amp.

(3) The phase difference between the FE signal due to external interference input and the above 3T component is detected, to sense the focus deviation direction, and the result is output as a DC voltage from Pin 30 (3T-OUT) of the pre-amp.

(4) The 3T-OUT voltage is input to Pin 75 (A/D port) of the servo LSI and the microcomputer reads the 3T-OUT voltage through the servo LSI.
(5) The microcomputer calculates the required correction and adjusts the focus loop offset in the servo LSI.

In the same manner as the auto gain control, this adjustment is repeated a number of times to raise the adjustment precision.

5) Auto Gain Control (AGC)

This adjustment has already been used in the previous generation of CD modules. This function automatically adjusts the focus and tracking servo loop gain.

The adjustment procedure is:

(1) External interference is injected into the servo loop.
(2) The error signals (FE, TE) when the external interference is injected are passed through a band pass filter and the G1 and G2 signals are obtained.
(3) The microcomputer reads the G1 and G2 signals through the servo LSI.
(4) The microcomputer calculates the required correction and adjusts the loop gain within the servo LSI.

To raise the adjustment precision, the same adjustment procedure is repeated a number of times.

6) Initial Adjustment Values

All the automatic adjustments use the previous adjustment value as the initial value as long as the microcomputer power supply is not cut off (the backup is not cut off). If the backup is cut off, automatic adjustment does not start from the previous adjustment value, but rather from the default setting.

7) The Coefficient Display for Adjustment Result

The results of all automatic adjustments can be displayed and checked in test mode.

The coefficient displays for each automatic adjustment are as follows.

(1) FZD cancel, TE.OFST cancel, T.BAL, FE.bias
Reference value = 32 (A coefficient of 32 indicates that no adjustment was necessary).
The display is in units of about 40mV.
Example: FZD cancel coefficient = 35
35-32 = 3 $3 \times 40mV = 120mV$
Since the corrected value is approximately + 120mV, the FE offset before adjustment was - 120mV.

(2) Focus and tracking gain adjustment
Reference value: Focus = 13, tracking = 20
The coefficient display shows the gain derease relative to the reference value.
Example: AGC coefficient = 40
Gain = 20log (20/40) = - 6dB

1.4 POWER SUPPLY AND LOADING SECTION

The power supply within the system makes the loading motor drive power supply VM (7.6V) and 5V Reg IC power (6.9V) from VD (8.3V) supplied by the mother board. The disc detection LED drive voltage and the CD driver IC power supply use VD directly.

The microcomputer switches the CD driver and laser diode on/off with "CONT" and switches the 5V power on/off with "CD5VON". There is no particular control pin for the loading motor driver, but the "EJ" and "LOAD" input signals serve the same role.

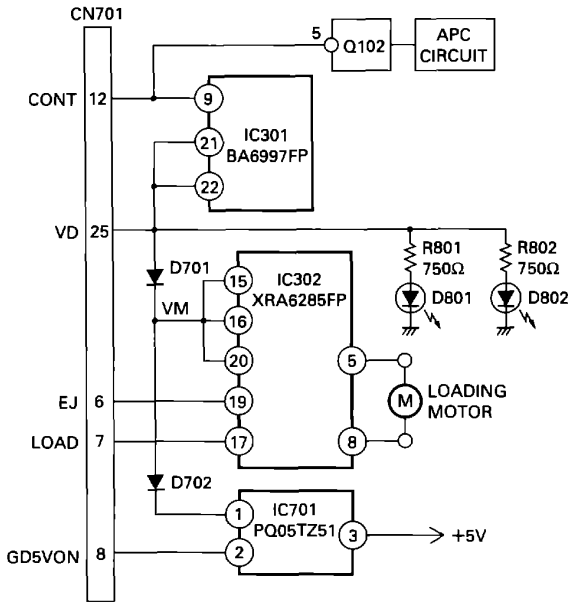


Fig.19 : POWER SUPPLY & LOADING SECTION

2. THE SUMMARY OF STRUCTURE

● Disc Loading Operations

1. There are two photo transistors before and after the rubber roller that conveys the disc. They receive light from the corresponding two LEDs. (When light is received, the photo transistor voltage is low.)
2. When a disc is inserted to just before the rubber roller, the front section photo transistor (P1) voltage goes high and the loading motor drive starts.
3. The drive power of the motor is transmitted by gear and the rubber roller rotates to transport the disc.
   The rubber roller is at one end of the loading arm and lifts up the guide arm. The guide arm is positioned by two springs. Therefore the guide arm and the rubber roller provide the appropriate pressure to feed out the disc between them.
4. The clamper arm also has a disc centering mechanism that discriminates the size of the disc and clamps the disc at the center of the spindle motor. The centering arms form a set left and right on the clamper arm and can move centering on their pivots. At the end of the centering arms are the lock arms. (The lock arms rotate about the centering pins and are locked to the clamper arm for 8cm discs.)
   For 12cm discs, the lock arms are unlocked and move to the position indicated in Figure 21.
   The detection arm, which has its center of rotation on the centering arm on the right side of the diagram, has different positions for 8cm and 12cm discs. When one of these discs is positioned on the spindle, the detection arm moves clockwise according to the external diameter of the disc and moves the detection lever to the bottom side of the figure.

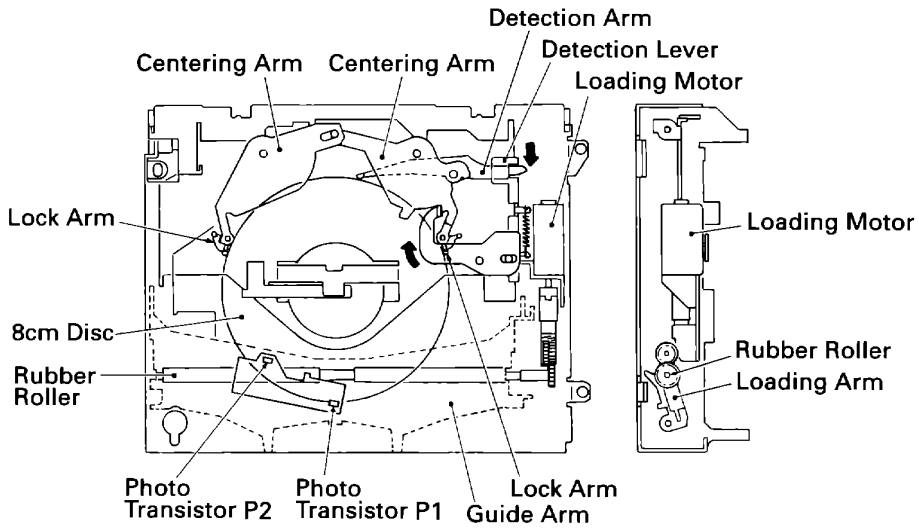


Fig.20

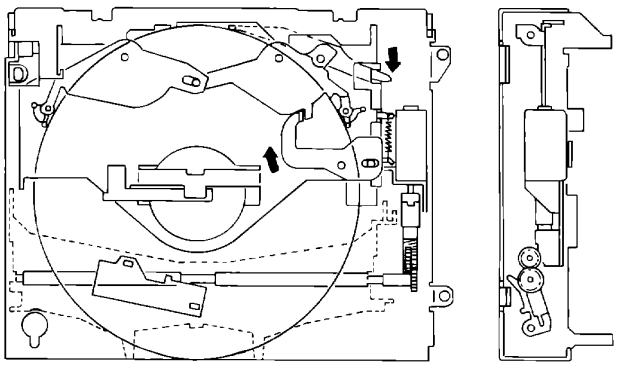


Fig.21

● Clamp Operation

The rack gear touching the detection lever meshes with the gear driven by the loading motor and rotates the L arm in the direction of the arrow in Figure 23.
The clamper arm, lifted up by the L arm, descends and clamps the disc. Also, the lock lever linked with the L arm moves the loading arm.
Because of this, the rubber roller descends, separating from the disc. At the same time the guide arm also descends. Loading ends at the position where the lock lever switches on the clamp switch.

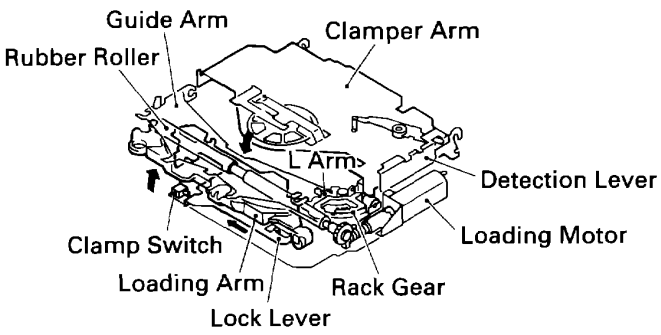


Fig.22

● Mechanism Lock Operation

1. In the eject state, both ends of the loading arm touch the bottom of the frame, the floating section front side is pushed down against the resistance of the mechanism suspension spring, and the disc insertion height position is found.
   For play, the loading arm rotates and the separation of the two ends from the frame bottom releases the floating section.

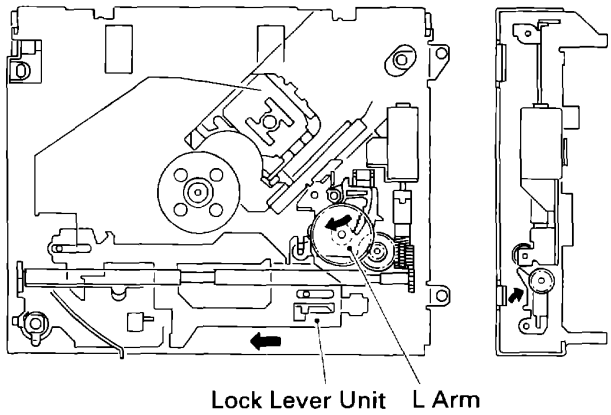


Fig.23

● Eject

1. The eject mechanism operates by reversing the rotation which takes place when the loading motor loads. The L arm moves and operates the mechanical lock, the clamp is released, the roller is applied, and the disc is conveyed. Loading stops when the photo transistor to the rear of the rubber roller (P1) is illuminated.
   However, in case of an 8cm disc, motor revolution stops a fixed period of time after P2 is illuminated. The disc type is recognized during play, by the voltage of the photo transistor (P1) located in front of the rubber rollers.

3. DISASSEMBLY AND ASSEMBLY

Remove in the order of the circled numbers in the disassembly diagram.

1. Remove the CD Mechanism Module

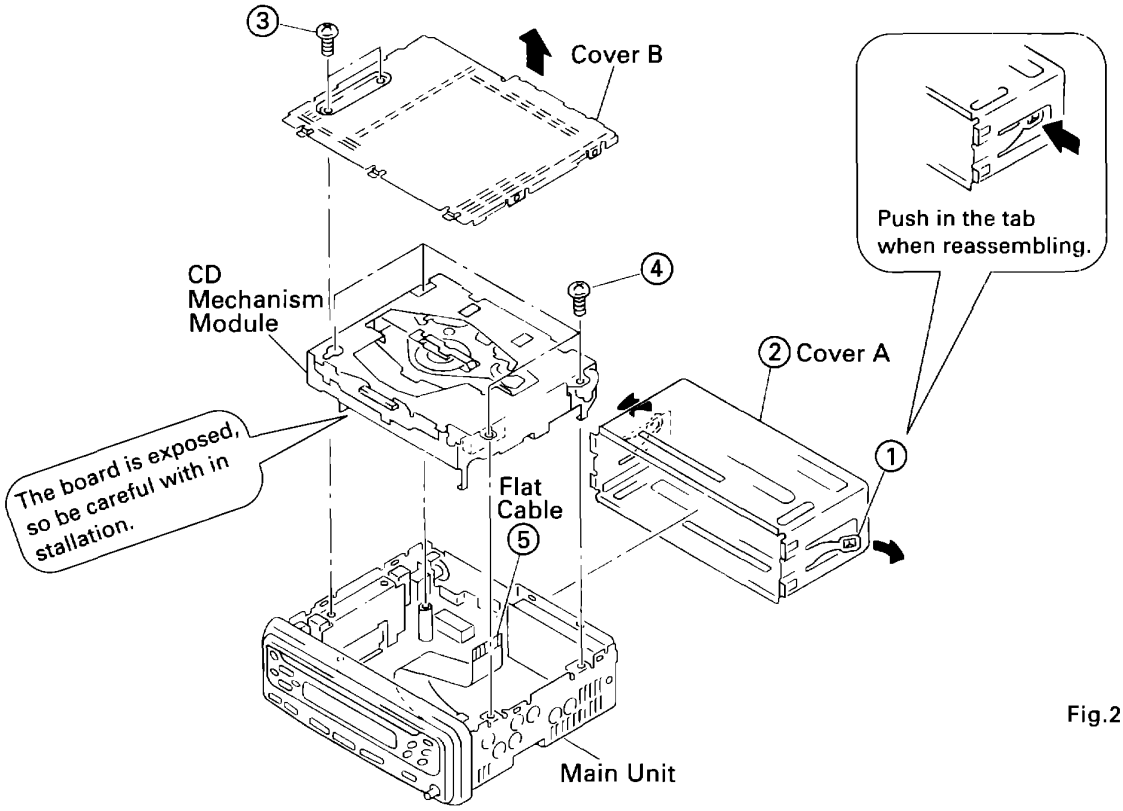


Fig.24

2. Remove the Damper and the Frame Unit

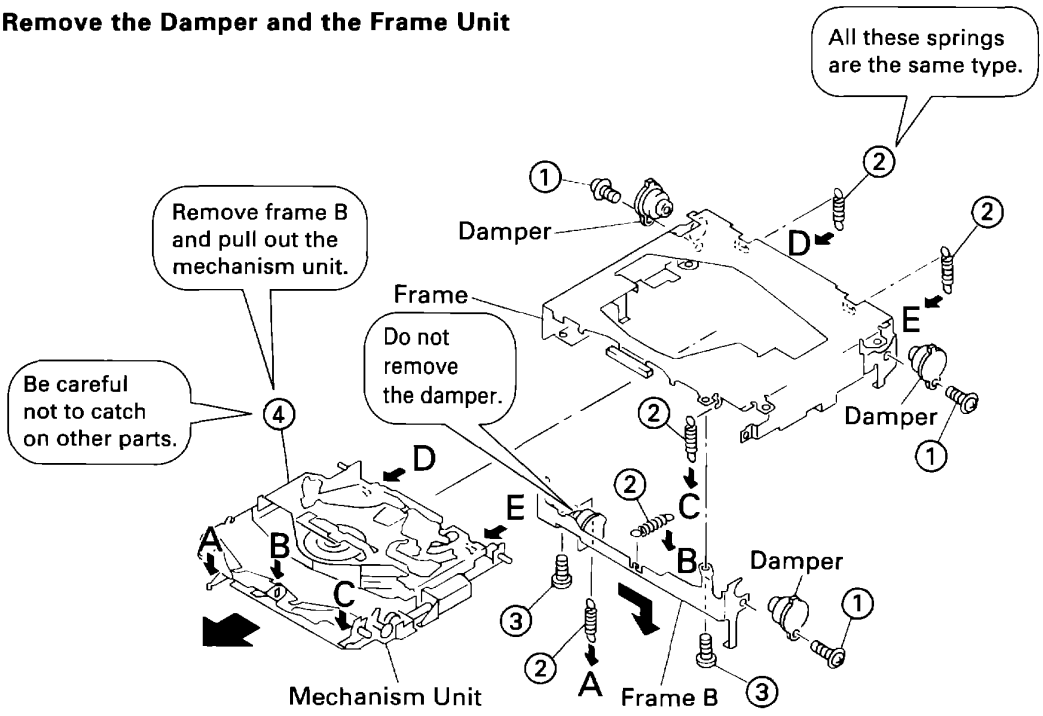


Fig.25

3. Remove the Spindle Motor

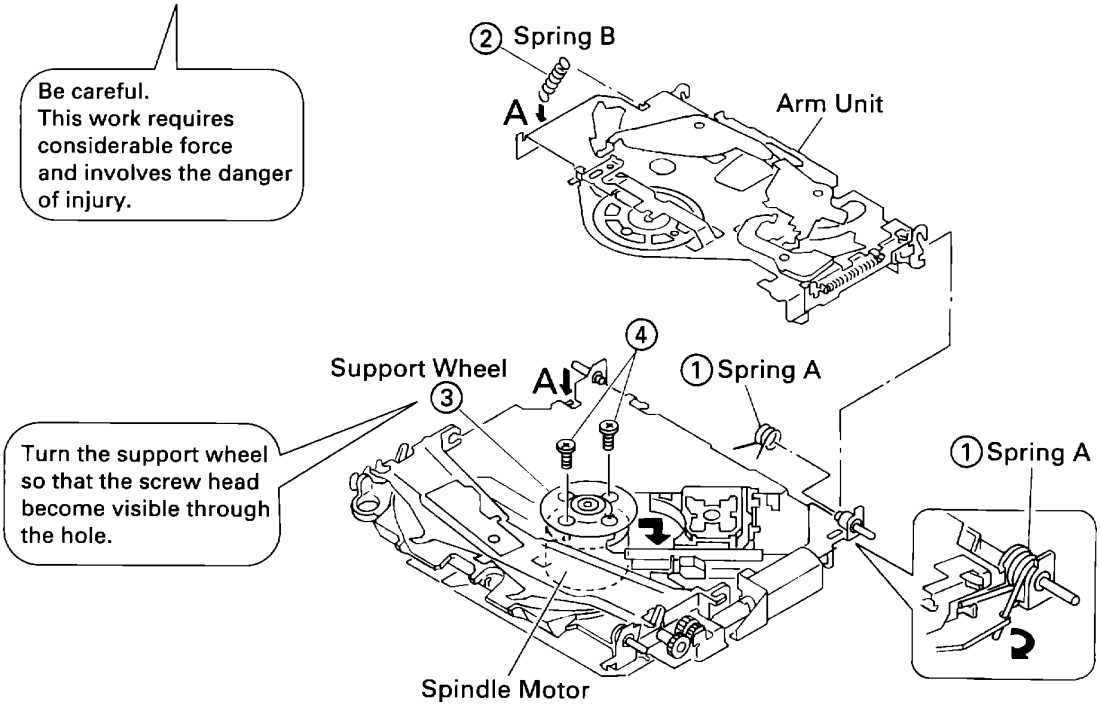


Fig.26

4. Remove the Loading Motor

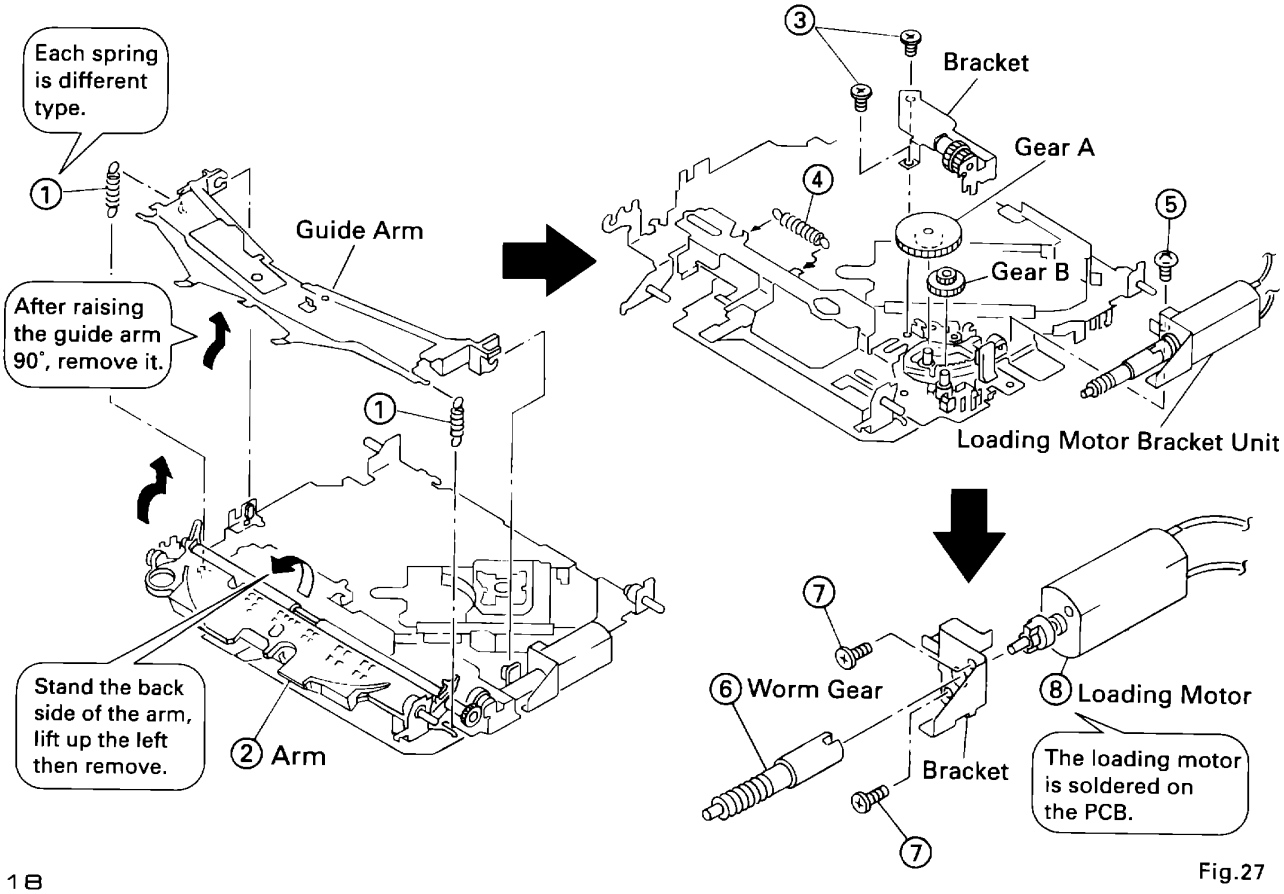


Fig.27

5. Remove the PU Unit and the Carriage Motor

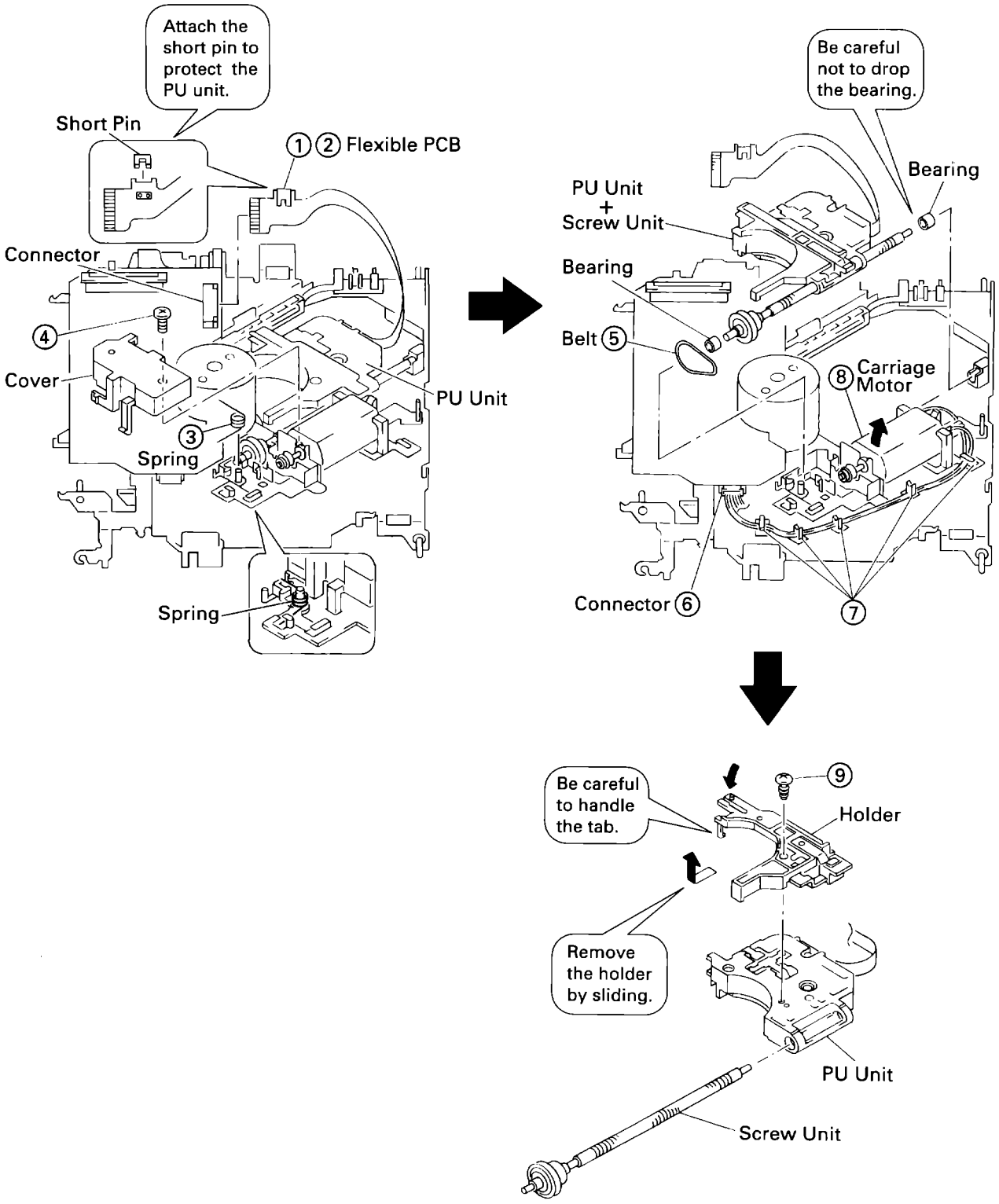


Fig.28